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Aero Modeller

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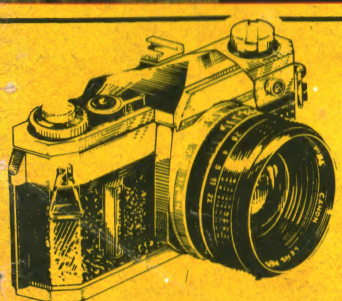

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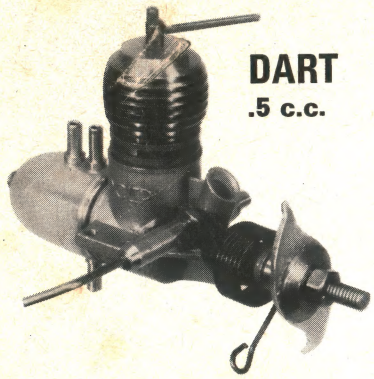
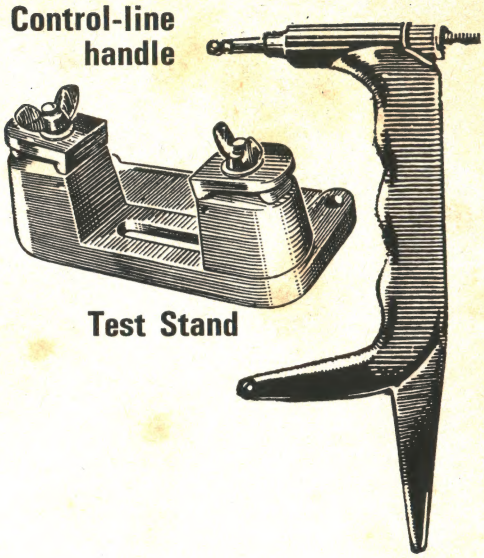


DART
.5 c.c.

WASP
.8 c.c.

Control-line handle



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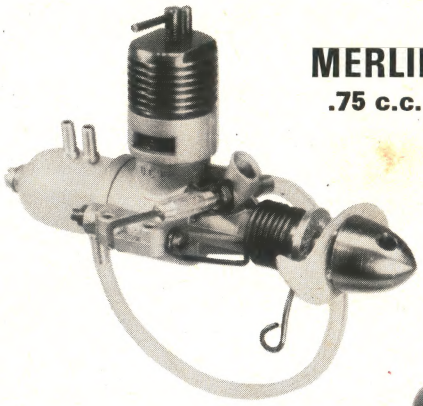

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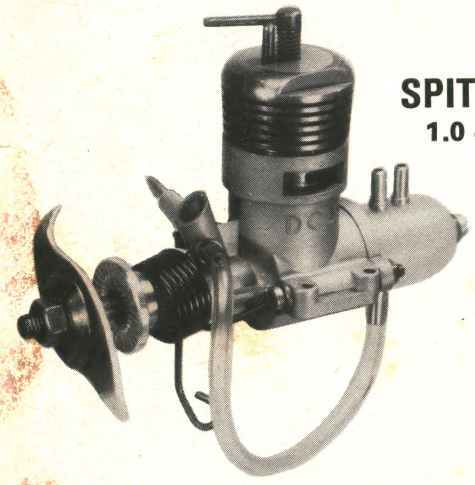

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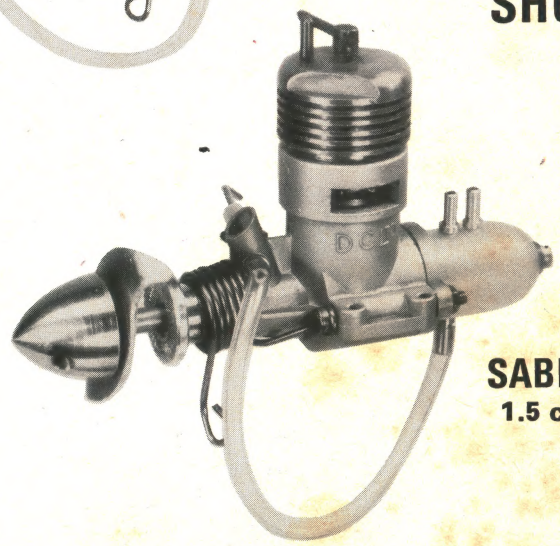

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NEW SIZES

Last month we told you about our new RIB STOCK. All quarter-grain sheet, 36″ long by 2″ wide in $\frac{1}{16}$″, $\frac{3}{32}$″ and $\frac{1}{8}$″ thicknesses. Stamped SOLARBO RIB STOCK for easy identification. You can go straight to it in the balsa rack in your local model shop when you are looking for stiff sheet for ribs, all-sheet tail surfaces, etc.

We have also introduced a number of other NEW SIZES in sheet and strip. Because we forgot to announce them in advance, not all aeromodellers may have come across them yet – but they should now be available at any model shop. Special lengths – and wider sheet widths – ideal for larger models (and in sizes you have specially asked for).

Finding enough of the right quality Balsa for cutting wide sheet has always been a problem (and the Balsa we use for cutting Solarbo sheet *has* to be the best). But a lot of aeromodellers *do* want wide sheet, and would like a bit of extra length on the standard 36-inch stock size. So we are now producing 42″ long sheet in *4 inch* and *5 inch* widths in the three most popular thicknesses. So now you can get:

Solarbo Sheet 42″ × 4″ in $\frac{1}{16}$″, $\frac{1}{8}$″ and $\frac{1}{4}$″ thicknesses
Solarbo Sheet 42″ × 5″ in $\frac{1}{16}$″, $\frac{1}{8}$″ and $\frac{1}{4}$″ thicknesses

You want even longer sheet? Then we already produce *48″ long sheet* as a standard stock line in all thicknesses (but this time in 3 inch width only). Here are the sizes:
Solarbo 48″ long Sheet in $\frac{1}{32}$″, $\frac{1}{16}$″, $\frac{3}{32}$″, $\frac{1}{8}$″, $\frac{3}{16}$″, $\frac{1}{4}$″, $\frac{3}{8}$″ and $\frac{1}{2}$″ thicknesses.

Do you need *long strip lengths* as well? Here we have introduced two new sizes in 48″ lengths. So remember you can now get:

Solarbo Strip 48″ long by $\frac{1}{4}$″ square and $\frac{3}{8}$″ square

For those of you who build large models we have also introduced 48″ long leading edge and trailing edge sections as well:

Solarbo 48″ long Leading Edge section in $\frac{1}{2}$″ and $\frac{3}{4}$″ sizes
Solarbo 48″ long Trailing Edge section $1\frac{1}{4}$″ × $\frac{5}{16}$″ and $1\frac{1}{2}$″ × $\frac{1}{2}$″

On large models, too – especially gliders – Spruce is often preferred to Balsa for spars. So we have extended our range of spruce strip to include two 48″ lengths:

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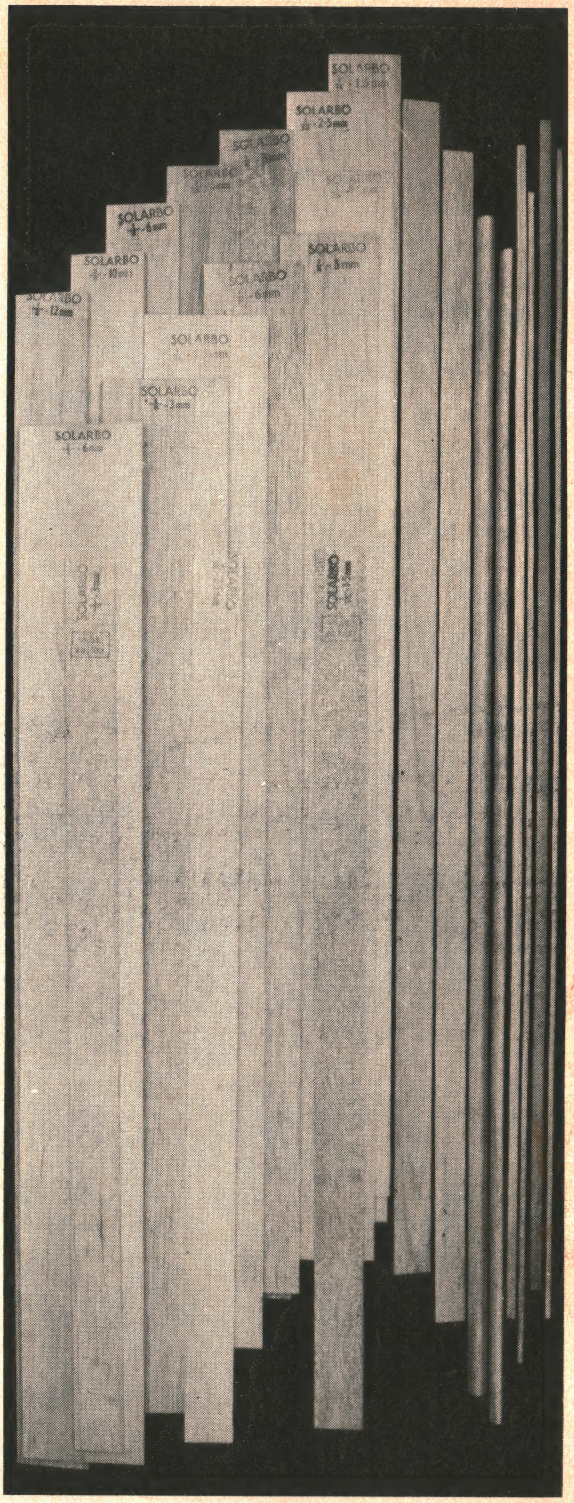

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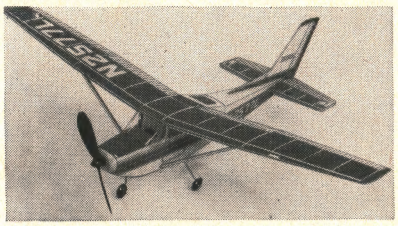
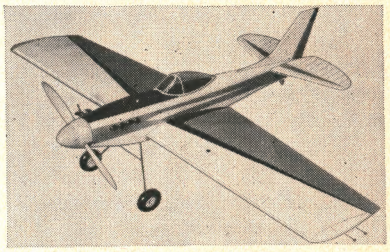


SKYWAGON Quickbuild pre-decorated and die-cut balsa parts. 23" span. Rubber driven plastic propeller. Ideal for Telco motors. Kit Price **£2.27**



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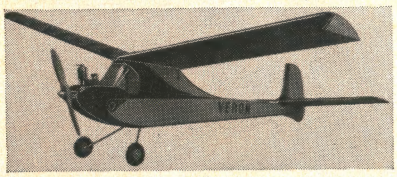

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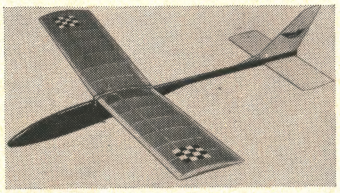

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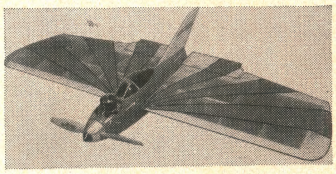

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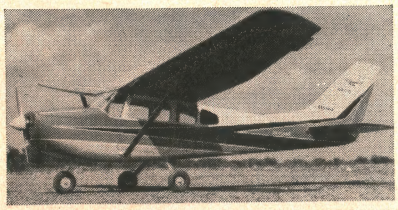

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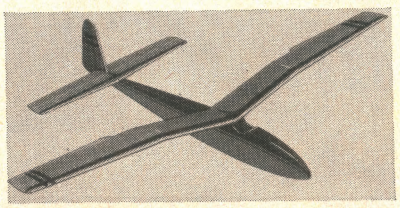

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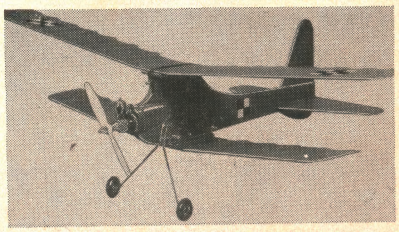

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Aero Modeller

INCORPORATING
MODEL AIRCRAFT

June 1978 Volume XLIII No. 509

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Advertisement Offices: Model & Allied Publications Ltd., P.O. Box 35, Bridge Street, Hemel Hempstead, Hertfordshire HP1 1EE. Tel: Hemel Hempstead 56117.
Subscription Department: Remittances to Model & Allied Publications Ltd., P.O. Box 35, Bridge Street, Hemel Hempstead, Hertfordshire HP1 1EE (subscription queries Tel: 0442-51740). **Direct subscription rate** £6.60 per annum, including index, $14.00 (U.S.) for overseas subscriptions.
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AEROMODELLER incorporates the MODEL AEROPLANE CONSTRUCTOR and MODEL AIRCRAFT and is published on the third Friday of each month prior to date of publication by

Model & Allied Publications Ltd
P.O. BOX 35, BRIDGE STREET, HEMEL HEMPSTEAD, HERTS HP1 1EE
Tel:. Hemel Hempstead 63841-2-3 (Mon.-Fri.)

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Comment

Model Flying, so long unrecognised as a sport here in UK, once again provided the opening to Britain's major sporting event, the FA Cup Final. SMAE members again flew control line aerobatics and combat before the 100,000 Arsenal and Ipswich crowd at Wembley.

Later this year the World Control Line and Scale Championships are being held in England at Woodvale in August, and will attract global support from many countries already receiving government aid for their modelling organisation.

The sport of model flying requires co-ordination of mind, body and reflexes, equal to that involved in many of the recognised sports.

SMAE, appointed by the Royal Aero Club to administer model flying, will make a renewed application to the Sports Council this summer. Recognition could lead to government grant aid which would benefit all UK flyers with help in providing local facilities.

Let's hope the publicity received through the media from this year's major model flying events help strengthen our case for acceptance.

on the cover

Gary Element, Gerald Oliver and Jonathan Moulton with KK Firebird, Telco CO_2, DB Tyro Major, Sig MiniMaxer and Humbrol Dragonfly. Typical teenage enthusiasts with one common link, in the Aero-Modeller Golden Wings Club. Photo R. Moulton.

next month

Good news for Vintage fans, details of Col. Bowden's Mouse design and information on the activities of the Society of Antique Modellers 35th chapter here in England from David Baker. Plans feature on Ken Faux's latest triple fin ½A power model and all the news from the Control Line Trials to select the British Team for this year's World Championships.

Don't miss this issue on sale 16th June.

AeroModeller is printed in Great Britain by Leicester Printers Ltd, The Church Gate Press, PO Box 20, 99 Church Gate, Leicester LE1 9FR for the Proprietors and Publishers, Model & Allied Publications Ltd, (a member of the Argus Press Group)
Trade sales by Argus Distribution Ltd, 12-18 Paul Street, London EC2A 4JS

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For the First Time Ever!

Yes, for the first time ever a major work has been written on *Model Aircraft Aerodynamics*! True, there have been a number of books that contained sections on model aerodynamics, Charles Hampson Grant in USA, Schmidt in Germany, D. A. Russell, and short booklets little more than monographs by R. H. Warring and others but this is the definitive detailed work that every keen aeromodeller will wish to have by him for reference.

It covers the entire theory of flight in relation to model aircraft and includes tables of ordinates of airfoil sections, scores of force diagrams and practical illustrations. The author tells how to take into account scale effect in its relation to model aircraft performance. He shows how performance can be improved in various categories of models by careful design and attention to aerodynamic requirements.

The purpose of the book is to present in practical and useful form some standard aerodynamics theory as it applies to model aeroplanes and gliders. Anyone whose interest in aeromodelling is more than casual will benefit from understanding the behaviour of his models better. He is less likely to make serious mistakes in trimming or control, will be able to build better, and may be able to improve the design of models. Apart from these considerations, aerodynamics is an interesting study in its own right and adds a further facet to an already enthralling sport.

ABOUT THE AUTHOR

It would have been quite possible for a pure theoretician to have attempted to write *Model Aircraft Aerodynamics* without really knowing the first thing about how to build a model . . . This could have been disastrous! Happily author Martin Simons is a dyed-in-the-wool aeromodeller first and foremost as well as a very skilled draughtsman, responsible for the many illustrations in the book. He is a leading specialist in the science of aerodynamics and has studied the subject over many years. He has contributed articles to *Aeromodeller* and is a prolific builder-designer of flying models. He has also been 'up there' himself as a qualified glider pilot.

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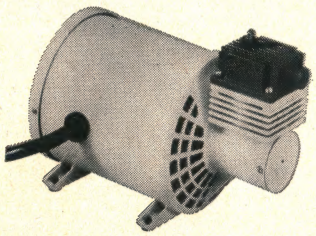

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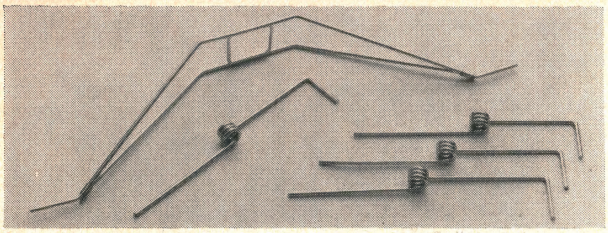

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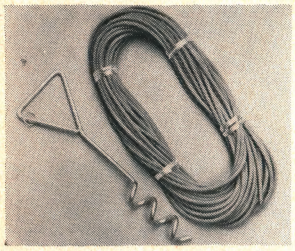

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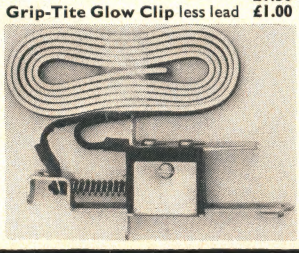

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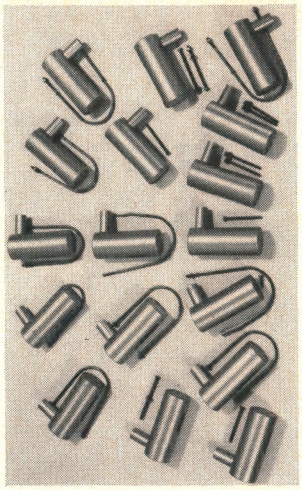

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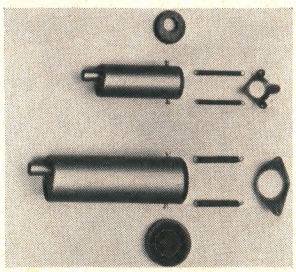

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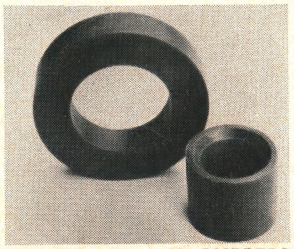

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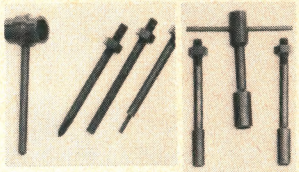

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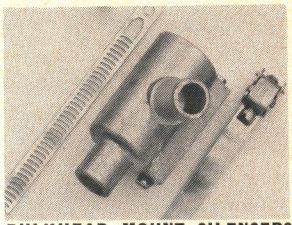

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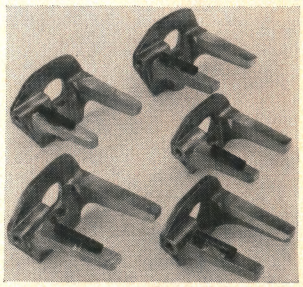

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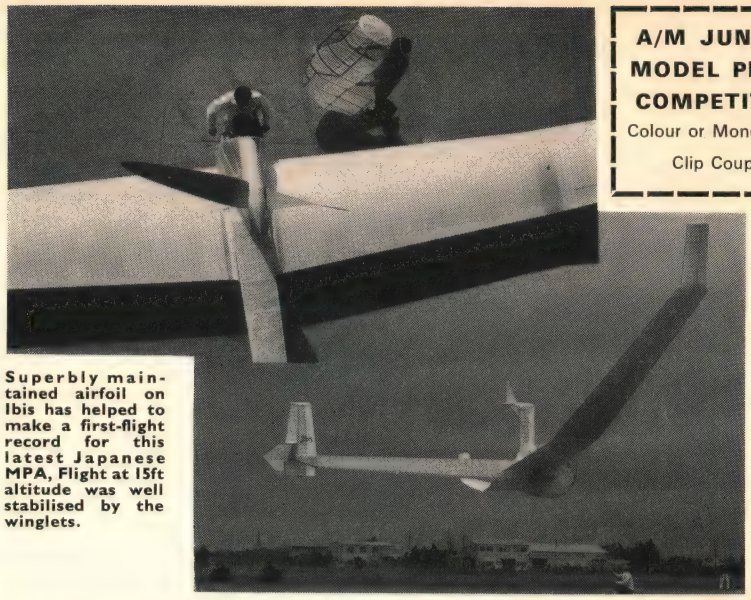


Superbly maintained airfoil on Ibis has helped to make a first-flight record for this latest Japanese MPA, Flight at 15ft altitude was well stabilised by the winglets.

IBIS is the name of the 1977/8 man powered aircraft now under test at Nihon University. Like the two *Stork* machines, the new one closely follows the design concept by Chris Roper in the *Jupiter* but the real difference comes in the use of winglets and a very faithful adherence to the Wortmann FX72-MS-105A aerofoil. Weighing only 75 lbs, Ibis first flew on 13th March at Shimofusa Air Base. Hiroshi Turui only intended to make a few 'jump' tests but found flight so easily sustained he carried on for 1100 metres which he covered in 2 min. 15 secs. This is something of a record first flight for MPA's and augers well for the future. Rib spacing is very close over the whole 67ft. 1½in. span and the reduction of induced drag by use of winglets has proved their usefulness. This is the smallest of the ten aircraft made by students of Nihon University under the direction of Professor Hidemasa Kimura. Clearly its target is an early attempt on the Kremer prize for the next (other than American) MPA to achieve the figure of eight course and a £10,000 prize. (See also Aeromodeller Annual 1977/78 and Man Powered Aircraft – Sherwin – Argus Books).

OLD WARDEN. Another busy summer is planned at the aviation museum airfield site of the Shuttleworth collection at Old Warden, Beds. Full size flying displays of their historic machines are programmed for the last Sunday of each month through until October, in this their 50th anniversary year. Additional events of special interest to model flyers include the *AeroModeller* All-Scale day on Sunday, 11th June, the biggest event of its kind held anywhere in the country, plus the annual All-Vintage Model day (including Fireball Trophy event for C/L) on 29th August. The Shuttleworth Veteran Aeroplane Society model section have arranged their open day for 16th July from 10am, with emphasis being a free flight and control line sport and scale.

Tops in the Pontins Ballroom challenge at Southport was charming Miss Maureen Hawsen of North Ferriby, Humberside.

OLD TRAFFORD. Pre-match entertainment originally planned for the Manchester City and United, foiled when the match was postponed on 4th February, finally took off at a later match on 27th March when Everton and Manchester United fans were treated to C/L aerobatics from Tom Jolley and Peter Coates. Combat followed from Lawrence Armstrong, Paul Bailey, Mark Jones and Chris Gilvray flying a fleet of Aerostars decorated in team colours which soon had the crowd on its feet drowning the sound of the engines.

Tom Tyrrel of Piccadilly Radio introduced the event live on the air for local radio listeners, which enabled follow-up arrangements to be broadcast for prospective modellers, publicizing local clubs and model shops. A great show, well appreciated by the crowds and above all excellent Public Relations for the sport of Model Flying.

I FLY THEM, I BREAK THEM, I FIX THEM. A daunting title to any true Aeromodeller, yet this Kodak movie film turns out to be very entertaining for a club evening screening. Sport Scale flying and full size restoration of WWI aircraft for show flying before the crowds of Rhinebeck Aerodrome, north of New York USA is the theme. The true spirit of these sport flying enthusiasts is followed from building to flying, including spectacular Balloon Bursting, Combat and Bomb dropping sequences for these R/C scale modellers. Zany action also from Cole Paylen's dog fight re-enactments with his full size planes. Running for 27 minutes, this 16mm colour optical sound track film is available from Random Film Library Limited, 25 The Burroughs, Hendon, London NW4 4AT.

PROPBUSTERS MIDSUMMER MADNESS. The influence of a full moon and summer's longest day have encouraged members of the *Propbusters MAC* to make an attempt at endurance control line flying. Scheduled for 21st-23rd June they hope to fly non-stop for 50 hours to raise money for charity on a sponsorship basis for the Sunshine Variety Club and the Royal Air Force Benevolent Fund.

The model is being designed by Kim Turner and David 'Sandy' Sanderson, with a 60in. span 12in. chord shoulder wing, powered by a Fox Eagle 60 with R/C throttle operated via a third line from a Roberts 3 line handle. The fuselage is being used partly as a giant silencer to minimise noise especially needed during night-time flying. So far the project is still at the development stage of trying and testing their ideas; let's hope all the problems are overcome by midsummer.

7TH SYWELL MODEL EXPO. This year planned for the Spring Bank Holiday weekend, not the traditional Easter date, to coincide with the Aerodrome's 50th Anniversary. Renowned for the Barnstormers' full size and R/C model flying demonstrations plus extensive trade stands. 28th and 29th May. Sywell Aerodrome, Northants, opens 10am. Admission £1, children 50p, parking free. Reductions for parties.

Mark Jarvis holds the latest of the L'il Quickies - a replacement for the one lost when an opponent's lines wrapped around him at Ouston. Ed Needham, the designer/builder claims to be the good looking one on the left.

Ed Needham's model that beat the experts

L'IL QUICKIE

28 inch WINGSPAN
GOODYEAR RACER
FOR UP TO 3.5cc MOTORS
1977 LEAGUE CHAMPION
—YET AN IDEAL INTRO
FOR NOVICE RACERS

GOODYEAR Control Line Racing was envisaged as a simpler introduction to the sport using $\frac{1}{8}$ scale profile replicas of the full size designs that have flown in Goodyear, Continental Trophy or other NPRPA formula racing events. This produces really handy sized models that only require realistic colour schemes and racing numbers to create a very neat semi scale appearance. Rules allow 3·5cc motors which result in genuine ton-up aircraft.

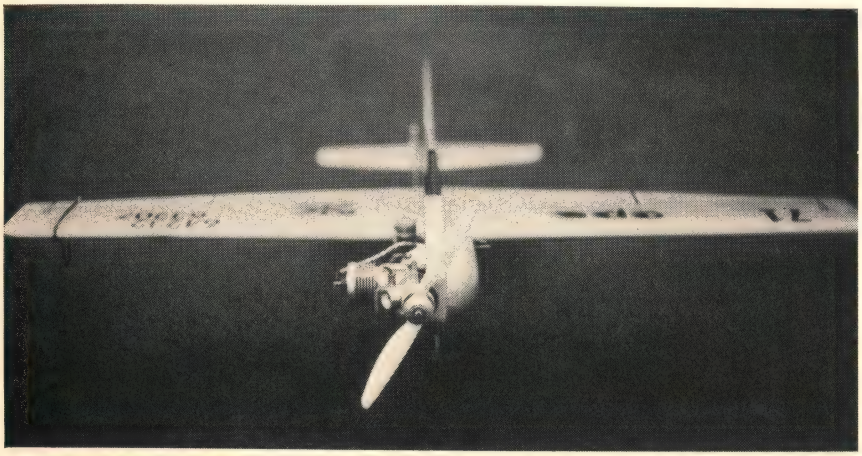
Here then is L'il Quickie by Ed Needham and Mark Jarvis, who started the 1977 season as novices and finished top of the annual Goodyear league list, so you see you don't have to be veterans to get good results.

The full size L'il Quickie is the 1974 development of the Owl racer and was chosen for a C/L Goodyear model because when scaled down, it results in a model with a very small fuselage side area and wing and tail planforms like a teamracer, almost a sensible tailed Ginny.

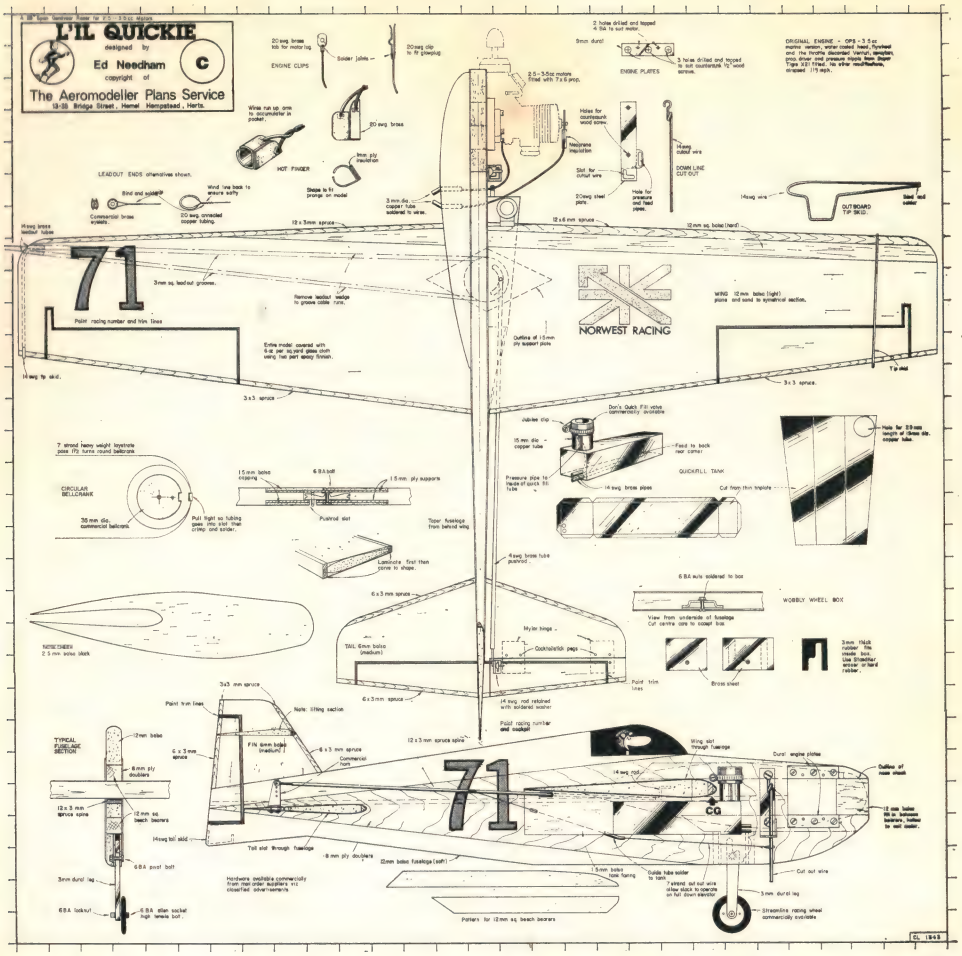
To some, the construction of this model may appear overstrong and therefore, overweight, but broken models don't finish races and with a 3·5cc glow up front, the more robust the better. The current model is light enough at 23ozs and is faster than an earlier 18oz version due to stiffer construction.

Begin by laying up the wing using PVA glue, not forgetting the $\frac{1}{2}$in. square hard balsa behind the leading edge of the outboard wing. This is to stop compression stresses developing after a fast catch. Lay up the tailplane and fin in a similar manner and leave the whole lot to dry overnight.

When dry, cut the hole for the circular bellcrank, ensuring that it is a good fit. It must be perfectly free, but close enough to deter the leadouts from slipping off. This fit is best achieved by drawing around the bellcrank and roughly sawing about $\frac{1}{16}$in. inside the line and then finishing off with a piece of sandpaper wrapped around a small



Head on view of this super fast profile fuselage racer. Rules don't allow motor to be cowled in but allow cheek cowl block which helps dampen vibration and improve speed. Note tip skid below out-board wing.



Full size copies of this 1/6th scale reproduction are available as Plan CL1343 price 8p+20p postage Export orders may be obtained through appointed agents price £1·80+25p postage ($3·20 U.S.) or direct by post (add 50% to order value for Airmail) from Plans Service, PO Box 35, Bridge Street, Hemel Hempstead, Herts HP1 1EE

bottle, Tufkote hardener bottles are ideal.

The advantages of a circular bellcrank are twofold. It is possible to get more movement than a triangular bellcrank using the same horn and bellcrank throws. A normal bellcrank geared up to increase the movement would produce a model more sensitive to slight handle movements. The control gearing and CG position of this model is such that you have to work at it to get anything other than the shallow climb and dive required for overtaking etc, but by nearly dislocating your wrist, you can get the model to 'square' into a wingover. The other advantage of the circular bellcrank is that the grooves in the wing for the leadouts need not be as wide, as there is no sideways movement at the leadouts, giving a stronger wing. The leadouts pass $1\frac{1}{2}$ times round the bellcrank, and through a piece of 18 swg brass tube which fits into a recess in the bellcrank. This tube is then crimped and soldered.

Cut the leadout grooves by removing the complete wedge between the leadout positions and grooving the edges approx. $\frac{1}{8}$in. × $\frac{1}{8}$in. using a piece of sand paper wrapped around a piece of $\frac{1}{16}$in. ply. Glue the wedge back into the wing and leave overnight to dry.

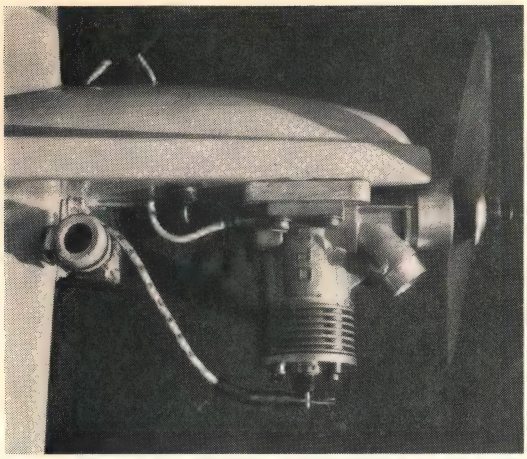
Carve the wing and tailplane to section, using a razor plane and a large sanding block. Take your time as nicely sectioned wings go faster and look neater. Carve the fin, noting the lifting section. This has the effect of reducing line tension at high speeds.

Recess the centre section of the wing to take the $\frac{1}{16}$in. ply bellcrank mounts, and fit the bellcrank and leadouts. Slide 1in. lengths of 14 swg brass tubing onto the leadouts and epoxy into the tip. Bind and solder the leadout ends using eyelets or annealed brass tubing to protect the wire from wear. (The same goes for your lines when you get to the flying field.)

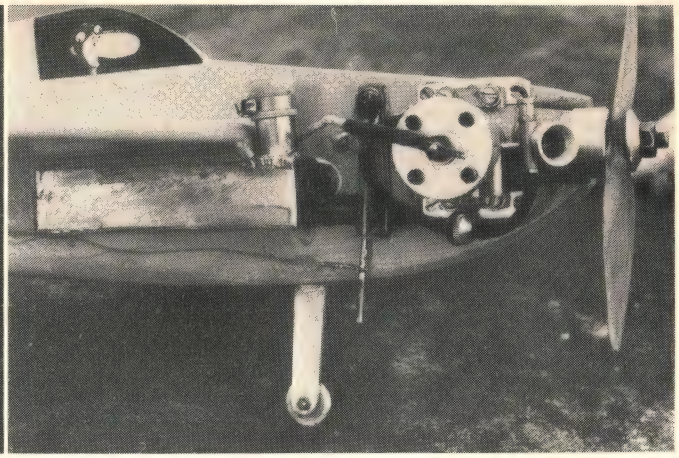
Cover the wing and tail with 0·6 oz/sq.yd glass cloth using Epoxycote or Tufkote, just as if you were covering with tissue and dope. When dry, rub down with 400 grade wet and dry paper, used dry. Separate the elevator from the tailplane and hinge. Our current model uses mylar strip hinges sold as R/C accessories which are cyano or epoxied into horizontal slots in tail and elevator. Cocktail sticks spiked through afterwards and sanded flush help prevent hinges pulling out.

Lay up the fuselage from $\frac{1}{8}$in. sheet and $\frac{1}{8}$in. square beech and add the fin. Taper the rear fuselage to nothing from behind the wing. Make up the 'wobbly wheel' undercarriage box from 20 swg brass or steel sheet, and epoxy securely into position flush with the inboard side with the pivot point $\frac{1}{2}$in. in front of the leading edge position. Add the $\frac{1}{32}$in. ply doublers and leave overnight to dry.

Carve the fuselage to a nice round section and cut the slots for the wing and tailplane, taking great care that they are in alignment with each other. Any misalignment will



Close-ups of the hardware above, shows OPS 3·5 marine after water jacket is removed from head. Other standard Super Tigre parts complete the motor. Note tube prongs wired to glow plug for hot finger connection during pit stops.



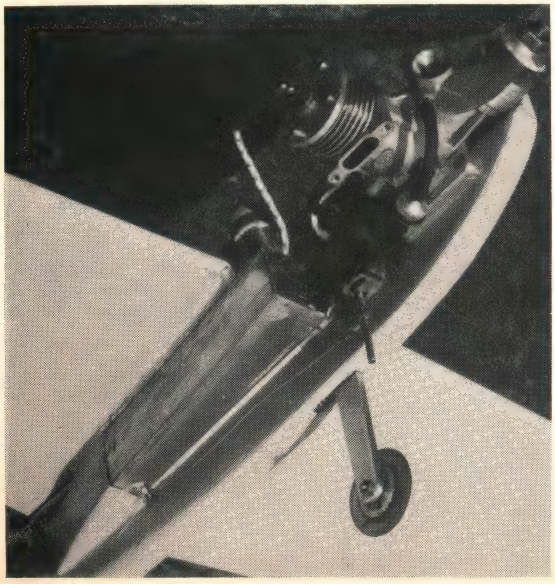
Tank uses Don's Quickfill valve secured with Jubilee clip. Both pressure and feed lines pass through cut out. Fuel filter is an added precaution for consistency.

show up markedly in the flight characteristics. Add the 1in. block cheek cowl and cover the fuselage with glass cloth as per the wing.

Epoxy the wing and tail into position, checking for alignment and squareness. Add epoxy fillets around the joints. Give the model the top coat of paint and add the racing numbers and transfers. Add the tipskids and the tailskid with generous epoxy fillets. Assemble the pushrod from 14 swg brass tubing and piano wire. We use 'S' bends to secure the pushrod – no soldered washers to fall off.

Cut the undercarriage leg from 10 swg dural. The axle bolt must be a high tensile (Allen cap) screw. The rubber for the undercarriage must be hard and fuel resistant – the rubber we use is that used as material for tyres on Team Race wheels. Rubber from an eraser is OK but it must be from a 'plastic' eraser. The best we have found is the Mars-Staedtler plastic eraser. The problem with all eraser rubber is that it breaks down after about three flying sessions. The T/R rubber lasted us nearly all season. The weight of the model appears to have an effect on the rubber life; many people have found the Staedtler rubber lasts well but our model from last season weighed 27ozs (ouch!).

Downline cut out shown in closed position lifts into L slot to allow fuel feed. Note tank fairing and Wobbly Wheel box for sprung Mono leg undercarriage.



Make up the fuel tank from tinplate or brass sheet, lapping the seams over $\frac{1}{8}$in. and tinning all joints. Butt joints will not do. The large bore copper pipe is the same as that used by central heating contractors, so now you know where to get yours, and Don's quick fill valves are often advertised by the larger mail order model shops. Test for leaks by connecting the feed and pressure pipes together and immersing the tank in boiling water. Anything suspect will be shown up under this test. When satisfied, screw and epoxy the tank into position. Add the tank fairing from scrap $\frac{1}{16}$in. sheet.

Assemble the cut-off from 20 swg steel plate and 14 swg wire. Screw and epoxy into position. Connect up the cut-off to the pushrod to operate on $\frac{3}{32}$in. to $\frac{1}{8}$in. of down elevator.

Cut and file the engine mounting pads from $\frac{1}{4}$in. dural. Attach the engine and epoxy the whole unit to the bearers. When set, remove the engine and check that the thrustline is in line with the wing and tail. If satisfied, drill $\frac{3}{32}$in. pilot holes for the countersunk woodscrews and screw and epoxy the pads down. When hard, flatten the pads off with a small file. This will stop the crankcase distorting when the engine is screwed down tight.

I don't recommend bolts through the bearers. For people who haven't the facilities for tapping, I suggest drilling clearance holes in the plates ($\frac{5}{32}$) and counter-drilling on the back of the plates slightly under the 'across corner size' of a 4BA nut deep enough to hide the nut. Using a vice, press the 4BA nuts into the back of the plate. We used 6BA bolts last season and kept breaking them. The heads were being pulled clean off them; a change to 4BA cured the situation completely.

Flying

Use a low geared handle, with the lines 2in. apart passing between the fingers, and a good grip to deal with all that line tension. With the centre of gravity as shown on the plan, the model flies rock steady, which means you don't lose speed by continually hunting up and down. Be wary of the acceleration if you are using a 3·5cc glow engine – the model may be no lightweight, but it doesn't exactly hang about on take off. The engine we use is an OPS 3·5 speed RCB with the flywheel, throttle, and watercooled

The latest L'il Quickie, a really straightforward practical design, would make a great trainer with a Sports 2·5cc motor, or with a racing 3·5 like Mark and Ed use, can manage 115mph!

head removed, and the venturi, prop driver assembly, spraybar and pressure nipple from a Super Tigre X21 substituted.

The motor is completely standard except for these mods to simply convert the marine motor for aircraft use. The Super Tigre X21 bits fit perfectly. The head is the original OPS part, the watercooled part merely being an extension above the combustion chamber which is simply removed and the head screws shortened about $\frac{1}{8}$in. to clamp down the remaining head. The upper LH backplate screw was removed and drilled through into the crankcase to allow the use of a Super Tigre pressure nipple. The flywheel and R/C throttle were discarded and replaced by a prop driver assembly, venturi and spraybar from a Super Tigre X21 but any of the G21 series Super Tigre prop drivers will fit (G21/29 to G21/46, X29 or X40). One feels reticent about recommending that a raw novice goes and buys an OPS (or a K&B, X21 or Rossi 15). It is far better to learn your trade on a more mundane motor like an MVVS or an Eta or any other 2·5–3·5cc motor. A raw novice with a 115 mph model is pretty dangerous! The motor is fitted with a 2v Taylor plug and a Bartels 7×6 type Tornado propeller. Fuel burned is 12% Nitro, 63% Methanol, 25% Castor Oil.

Details are also shown of the hot finger arrangement of connecting the accumulator to the plug quickly during a pit stop. The non-spill Acc: in the pitman's pocket is wired to the finger attachment which locates on the model connection wired directly to the engine plug. This saves valuable seconds spent fiddling with usual glowplug clips.

So there you have it, all our secrets, nothing really too difficult so why not give Goodyear racing a go? There's plenty of room for new teams and with a bit of thought and hard work, it's not impossible to reach the top. Go on, get building.

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topical twists

by 'Pylonius'
Illustrated by Sherry

"Did you build it yourself, mister?"

Back to Square, Square One

Someone, seemingly disillusioned with the way free flight contesting is going, or has rather gone, calls for a return to the sanities and disciplines of the past – to a time when free flight models still retained some of the niceties of orthodox layout, like undercarriages, and when the competitors were marshalled into an orderly flight succession by no-nonsense rule conscious officials. Out would go all the devious shifts and ruses of tactical flying, with not a detergent wafted bubble or undulating strip of mylar to mar the well regulated scene; in would come the roped off enclosure in which the contestant would be conducted to the take off board in a walk-the-plank gravity, with not the time to get the merest whiff of a burgeoning thermal before a compulsory launch into the come-as-you-get-it air.

Well, it all sounds very uplifting, but is it all that practical in these more permissive times? The contester today is not as forthcoming as his counterpart of a quarter of a century ago, and will only turn up at the distant airfield if given the right sort of inducement. He looks forward to a nice, free and easy day during which to exercise his own pet brand of tactical flying and indulge his own personal approach to rule bending. What he insists upon today, as an almost unalienable right, is his own pet timekeeper: someone who knows the foibles of his models, appreciates that he would have done a max had the model stayed in sight, not d/t'd early, had a decent rubber motor, a good tow launch or a full length engine run. A strange timekeeper might not be so sympathetic; perhaps spoil a whole day's outing by recording what obviously should have been a no flight.

Another intrusion on decent flying field freedom, widely practised in a more authoritarian past, was something called model processing. Not prepared to take a chap on his honour, a bevy of grim officials would swoop upon a model, particularly one that had placed in a contest, and subject it to a series of specification tests, ready to penalise the well meaning model flyer for a model a couple of measley ounces underweight or carrying a few grammes of extra rubber.

Happily for the continuance of contest flying it would not be possible to recruit all the necessary officials for a revival of yesteryear style flying procedures. An Area is jolly lucky if it has one volunteer to conduct the now familiar shoestring contest arrangements, and he is usually regarded with awe and wonder for such commitment and dedication. The chances of parading an early fifties consortium is about as remote as a close encounter of the third kind: there wouldn't be a flying object, identifible or otherwise, in sight.

Doing Famously

Quite a few famous people fly model planes these days as a socially acceptable way of relaxing from the rigours of a public career. Since they do not exactly have to buy their goodies on extended credit like lesser mortals they appear to use a cheque book more often than a building board. In the old days the celebrity would earn public kudos from a cosy magazine article about his off stage, rolled up sleeves, hobby, be it violins made of matchsticks or even the actual, physical building of model aircraft. In the jet set age the hustling VIP hasn't got that much time between the public appearance and the trendy sunspot to indulge in any homely sort of hobby, and the model he is likely to fly is the prize exhibit at the latest Toy Fair.

This highlights the change in the public approach to our hobby since the traditional strip of $\frac{1}{8}$in. balsa was replaced by the fibreglass rod. No longer does the curious urchin on the flying field ask, "Did you build it yourself, mister?" He would think you all sorts of a poverty stricken nit if you had done, but tell you instead of the £45 kit his mate got for Christmas, and how he hopes to start radio flying himself on his tenth birthday.

When the old model pioneer staggered on the flying field, or rather local park, with his cane and wire contraption no one had any doubt that he had built it himself. But as time went on and the lengths of home split cane became factory prepared strips of balsa, more and more prefabrication found its way into our models, the work of the model constructor was more that of assembly than creating from the raw materials. Now when someone boasts of having built a particular model note is taken of the fact that the radio, the engine, the airwheels, the moulded wings etc, etc, came over the shop counter, and anyone building a model from scratch, as it were, is regarded as indulging in a bit of hair shirt exhibitionism.

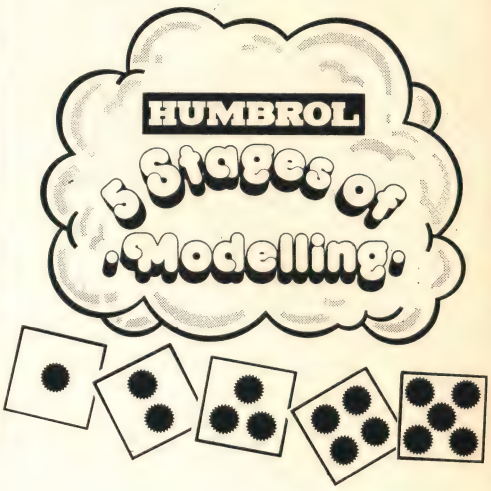
Small Wonder

The 'big is brutiful' trend in aeromodelling, through which the glory seeker could dominate the airfield – and the front covers of the model mags – with sheer volume of model and weight of engine power, may be coming to an end. Those four engined fantasies, weighed down with enough kilos to put the Air Ministry on the alert, could soon be creating transport problems for the junkman. The new 'in thing' is miniaturisation. Electronically, the model radio may well undergo the sort of almost indecent shrinkage that reduced the once bulky computer to a calculator extension of a modern wrist watch. Those tiresome journeys to the distant airfield in an equipment lumbered car may soon be a thing of the past; your flying field will be nothing more than your own back garden, and your take off strip the path to the tool shed. Just imagine your model zooming over the herbaceous border, looping the loop over the lupins and doing a spot of combat with the Monday wash. Apart from the risks of a sudden pounce from a marauding moggy or a fly away into a neighbouring garden, a Sunday morning of aeronautical sport conducted from the French window, as opposed to all the complications and restrictions of airfield flying, should be quite blissful, and go far to keep the conjugal peace.

And there seems no reason to doubt that ultimately we shall be doing our radio flying from the comfort of the lounge armchair. "Do you keep having to land that thing on the top of the telly? I wouldn't mind, but look what it's doing to the picture. It was a lot better when you did all that sort of thing over the airfield."

KIT REVIEW

Paul, Gerald and Jonathan with four of the Humbrol 'family' on test in the local fields. These small models proved ideal trainers for construction and flight trimming.



Humbrol's range of Beginner's models

THIS GROUP of specially designed easy to build free flight models has now had just over a year of exposure. It represented a completely new approach from a Company previously best known for its exclusive attention to paints, adhesives and dopes and it came at a time when much encouragement was needed with new products for the novice.

We asked Gerald, Raynard, Paul and Jonathan to make the kits, fly them over a full season and then produce their comments. Their modelling experience was limited to just a few small models, as might be expected of 13-year-olds. Actually Paul's knowledge was limited to plastic kits – so this was a true test in every respect.

Stage 1 in the series is *Ladybird*, a 250mm all-balsa chuck glider which Gerald found very simple, with everything supplied including – naturally – Humbrol cement. When finished, the *Ladybird* was found to have one wing panel much heavier than the other. This was cured by the simple expedient of tip weight on the 'light' side. Nose weight (Plasticine) was unsightly as a 'blob' but the model proved its worth in teaching how to balance for a long, smooth glide. Weak point is the rear fuselage which snapped several times – a lesson here in repairs was not entirely unwelcome.

Like all the five stages, a stick-on decal of the name, with single spot for

Ladybird is a small starter which Gerald is testing with a modest launch to check the balance after adjusting nose weight.

Raynard's Firefly is tapered to narrow wing chord and is not the easiest glider to tow launch Simple construction introduces the novice to tissue wing covering as does the Wasp, rubber powered equivalent

number one in this instance, added decoration and identification. For the raw novice, this is a good introduction but be prepared to repair! The proportions are good for longish flights and teach the technique of chuck launching.

Stage 2 is the *Wasp*, a 500mm 'stick' type rubber model with a built up wing, made by Paul. He found the instructions very clear for the small amount of work required and finished the *Wasp* within a day. His only problem was a propshaft that was barely long enough to engage the plastic propeller let alone bend into a loop end to accept a winding hook. He would also have appreciated instructions on how to fit a rudder for trimming. Finished weight was just a couple of ounces and on the two strand motor of rather ineffective substitute rubber supplied, the flight performance was passable. Replacement of the motor made quite a difference to performance with climb to tree top height for 30–40 second flights. The *Wasp* was very stable and tolerant, even surviving a loop or two into the ground until rudder was 'discovered' as a means of producing a spiral climb.

Stage 3 is *Firefly* which spans 700mm and is a tapered wing towline glider, made by Raynard who soon discovered the need for a dihedral brace. The built-up wing presented no difficulty either in construction or covering. Its dihedral is shallow but this had little effect on the towline where in any case so small a glider is bound to veer to one side.

Tail and the fuselage are all-balsa, die-cut to shape and easy to assemble. The nose accepts ballast in the form of lead shot, and with a cabin style sticker, the looks are improved considerably. Weighing only 2 ounces, *Firefly* is a calm-to-moderate wind model which teaches the basics of towing and trimming through practice. Apart from the dihedral joint weakness, it is a robust model with satisfying flight performance, doing what it sets out to do admirably.

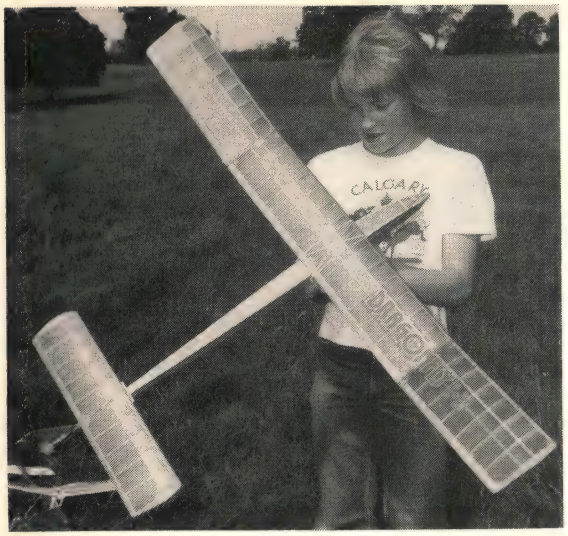
Stage 4 is a built up cabin fuselage type 760mm rubber model which Paul is convinced ought to be Stage 5 – or even 6! Humbrol say it was included to "challenge the skills of the developing modelling enthusiast" and *Hornet* certainly did that for Paul. He found the fuselage construction a little difficult and when it came to fitting the noseblock he cemented it in place, simply because there was no instruction as to what he should have done. His pals were able to advise that the noseblock should plug-in and pull-out for winding the motor. When making the wing, all went well until the dope pulled the trailing edge into a mountainous skyline effect. Perhaps Paul was over enthusiastic with the clear dope but a word of warning to reduce the shrinking effect by thinning the dope would not have been amiss.

In any case, *Hornet* was oblivious to all the concern for its strange and kinky wing. It flew perfectly and on up to 200 turns, even with the substitute rubber, it made very satisfying flights.

At four ounces, and approx 30in. span, it is an extremely tolerant design which reminds one of that ageless 'A.M.Cabin Duration' model created by Bill Dean over 35 years back and *still* popular in APS. The formula is obviously a good one for instruction in built-up models and patience in flight trimming.

Stage 5 is, of course, the biggest, an 1100mm A/1 towline glider which to quote Humbrol "brings together the techniques of construction developed by the earlier stages of the series". Jonathan already had the experience, which was perhaps a trifle unfair

Hornet gave Paul a quick lesson in over-doping, but the twisted wings were almost symmetrically affected and it flew perfectly! Gerald subsequently made another which came out true and flew even better



Dragonfly is a very light glider which Jonathan has found to be thermal-prone It needs half its weight again in ballast to meet SMAE A/1 class rules A D/T is advised, also the auto-rudder for straight towing

because his previous frustrations (with other makes of kit) had taught him how to interpret otherwise inadequate instructions. He said the *Dragonfly* could be improved by making the instructions clear, and changing a few points. Such as – instead of pinning formers upright and adding sides, lay one side down, add three formers, then the other side and carry on otherwise as shown. Also, he discarded the towhook and made another as the provided, shaped hook could not be pushed through F13 as advised. Besides, he likes a long hook. On the wing, Jonathan suggests that ribs W4 be fitted at stage 7 to be sure they are at correct dihedral angle and that the gussets be added immediately after stage 7 to secure the dihedral. He made smaller ply auto-rudder parts and arranged for a fuse dethermaliser – which turned out to be a very wise precaution!

At 5 ounces, the *Dragonfly* is a real competitor, although it requires a further 2¾oz of lead ballast to bring the model up to the correct weight. It floats and will hook on to the slightest lift. As long as the wing and tail are doped carefully with panels held to a flat board while drying, the model comes out as a very neat and practical design for one's very first competitions.

With an auto-rudder it tows easily, but without – it's just another 'weaver'. So it teaches the novice builder an awful lot at all stages. It's a design that is bound to be popular, and will be seen in numbers at the Nats for sure. The thrill of a 'max' with the model wafting higher at each circuit, until the tail pops up to relieve the tension, is the finest experience *Dragonfly* can give – and it has already done that several times over in its year of testing.

To summarise. Humbrol have produced an excellent building course for modest outlay. Any novice is bound to learn the rudiments of construction and flight through these five good models. *Ladybird* £0.95; *Wasp* £1.95; *Firefly* £2.75; *Hornet* £4.25; *Dragonfly* £3.75.

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SMAE Hon. Sec. George Lynn waits with Elton Drew's A/1 glider at the Odiham Spring Gala. Right: Pete Bayram won HLG and also reached the F1A fly-off with this American kit A/2 the Jetco Talon at the Odiham spring gala.

Free Flight Scene

SE AREA SPRING GALA – *Odiham, 9th April*
This gala was organised by the South East Area of the SMAE in conjunction with FLEET and DMAC. After a week of stiff breezes, Sunday's light winds came as a pleasant surprise to those who made the trip to RAF Odiham in Hampshire. Temperatures were below average for the time of year, quite cold in fact, but there was plenty of thermal activity under the solid overcast sky as demonstrated by the eight flyers who had perfect scores to qualify for the F1A glider fly-off. Andy Crisp, flying his 'Flashback' went on to find a further patch of good air to win and take home one of the unusual silver plated goblets that were on offer. Other prizes were sets of glasses and suitable beverages with which to fill them but John Jones, SMAE Vice-Chairman, warned the winners against sampling their spoils before driving home!

F1A (*33 entries*) – 1. A. Crisp (Biggles) 15:00+5:31; 2. P. Scrivens (Cheltenham) 15:00+4:15; 3. M. Dilly (Croydon) 15:00+4:04. **F1B** (*18 entries*) – 1. D. G. Digby (Croydon) 15:00+2:29; 2. J. Bailey (Bristol & West) 15:00+2:26; 3. R. Elliott (Croydon) 14:45. **F1C** (*9 entries*) – 1. K. Faux (St Albans) 15:00+4:16; 2. F. Chilton (Crookham) 15:00+2:25; 3. R. Monks (Birmingham) 14:21. **A/1** (*21 entries*) – 1. P. Cameron (Crawley) 9:22; 2. L. A. Rogers (Swindon) 9:16; 3. G. Madelin (Crookham) 9:10. **Coupe d'Hiver** (*16 entries*) – 1. T. Grey (Brighton) 9:28; 2. R. Scales (Leicester) 9:26; 3. G. Ferer (Leicester) 9:24. **½A Power** (*15 entries*) – 1. A. R. Wells (Anglia) 10:00+2:25; 2. D. F. Pepperell (St Albans) 10:00+2:41; 3. J. Fletcher (St Albans) 10:00+2:39. **Hand Launch Glider** (*10 entries*) – 1. P. J. Bayram (Richmond) 5:00; 2. P. Davies (Richmond) 4:51; 3. J. Tipper (Lee Bees) 4:43.

CARDINGTON – *26th–27th March – Report by Bob Bailey*
Sunday, this was the first event of the indoor season and it was good to find the shed was still there, albeit with a couple of holes, improvements and rebuilds to the doors, which meant a minimum gap of about a foot. By Murphy's law the wind direction was such that it howled through the gaps to such an extent that the barrage balloons moored by the doors waved around in the breeze! Conditions were rather cold and extremely turbulent near the doors but somewhat better in the centre of the shed.

After Laurie Barr had read the riot act to everyone present about not climbing around or trespassing, there were no problems in that respect. What did cause some difficulty was the number of people who turned up to fly HLG, the first event for the Sweepette trophy. HLG flying time was restricted to 1½ hrs out of each three but the number of models being flown decreased rapidly as the day progressed and the crowding problem had vanished by mid afternoon.

Quite a few people were flying Manhattans, an ideal class for such poor conditions so it was disappointing to get only three entries. Laurie Barr had his new Manhattan going well and put in a couple of good flights, the second being a daunting 6·28. He looked at me as if to say 'get out of that'. So I wound up the usual motor which has served me well and the model climbed higher than usual, stayed up and stayed. It ran out of turns 30ft up for a new record time of 7·05. This prompted Laurie to wind up again with 200 more turns, the model climbed away but stalled almost vertically, tail slid in and broke the tail unit. Bernard Aslett, using some of Laurie's rubber, showed his gratitude by beating him into 3rd place.

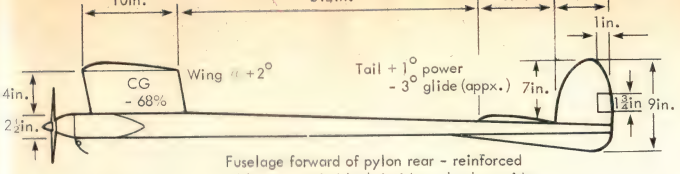
The turbulence proved a great problem for EZB and it was a day for strong models. Dave Pymm's only flight to fly a normal pattern showed the quality of his model with 16.32, the best of the day. Graham Davitt on his first visit to the shed had a model strong enough and flew most impressively to get a 14.30 and placed 3rd! He is now automatically promoted to expert class, incidentally beating his Dad (not bad for a Junior); Derl Morley flew with consistency to take 2nd.

On Monday the conditions were just as bad but warmer and wetter, causing a few problems for CO_2 Duration, with my motor for one icing up at times. Two large models from Ron Green and Geoff Lefever specially built for the meeting, failed to survive the previous day's trimming. Ron's had a glide circle that was at times bigger than the width of the shed and got hung up and damaged. Geoff had a wing on the tailplane fall off on several occasions and his efforts were abandoned. So it became a battle of the smaller models, that is until Ian Dowsett arrived with a big one covered in 0·25 thou mylar; model weighed 26g total (14g for the motor!).

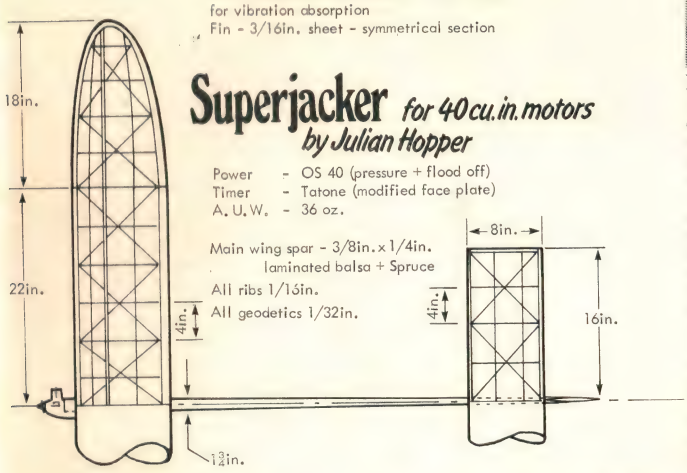
I managed to break 5 minutes in practice but first contest flight was less than one minute. Geoff was in a winning position for a long time with over nine minutes total – until Ian got going. Long motor runs of 3-4 minutes and a superb glide gave Ian a clear advantage and he won easily. He then went on to do a practice flight of 6·42 including a 4½ minutes motor run. The biggest factors are the large prop 7in. diameter and a large light model of about 44in. span. A most interesting class.

It was not a vintage day for FAI microfilm, proving to be difficult to get the models up to the roof. The turbulence was particularly vicious for these slow flying models and didn't encourage much flying. Ron Green did the best time – a very fine 32.40 but Dave Pymm's more consistent flying gave him the edge. It was a good day for practising balloon steering but even if one did that right,

Ron Green shows his latest CO_2 model to Laurie Barr at recent Cardington meeting. Mylar covered, the model was damaged during practice.



Fuselage forward of pylon rear - reinforced with cross grain block inside + cheek outside for vibration absorption
Fin - 3/16in. sheet - symmetrical section



Superjacker *for 40 cu.in. motors by Julian Hopper*

Power - OS 40 (pressure + flood off)
Timer - Tatone (modified face plate)
A.U.W. - 36 oz.

Main wing spar - 3/8in. x 1/4in. laminated balsa + Spruce
All ribs 1/16in.
All geodetics 1/32in.

turbulence could cause a wrecked model. Roger Melville was unlucky to lose two wings in this sort of manner although most people enjoyed a lot of flying despite bad conditions.

CARDINGTON IHLG MEETING – *26th March 1978 – Report by Kevin Brown*

Entries were well up on the usual handful to be found at past HLG meets at Cardington. A few established outdoor faces were trying their arm for the first time indoors; unfortunately the gale force winds outside made their presence felt inside through numerous cracks and made flying a very nervous business. Phil Ball for one preferred not to risk his outdoor models after seeing his glider develop a love affair with what must have been a very lonely girder high up in the shed. Both he and Chris Edge did well in the 12in. class, however, and were reaching an appreciable height. We eagerly await their performance in the Open category.

Steve Phillpot was launching consistently well and was never far behind Mike Fantham. As an example of how trying Cardington can be, it was only after five hours of trimming and repairing that I managed to get it together and could begin full strength launches. After finally finding my rhythm I was rewarded with my first minute indoors to take the lead; at last I was smiling. Indeed we were all happily enjoying ourselves until near the end of the day when Mike managed to find lift after producing a near perfect launch; his flight of 67 secs pushed him into first place and would in fact have stood for a record had he been timed by two watches as stipulated in the rules.

It was quite a revelation to discover lift inside the hangar in this way but it's true folks. In fact Mike Page who had the 12in. class all day, had probably benefited similarly when flying with strong sun shining onto the southern wall early in the morning producing a remarkable flight of 52 secs, with his 12in. class model.

So just as we were becoming acquainted, the meet was over; the chuckies' graveyard had claimed quite a few. However, despite mixed fortunes, there is one very satisfying element about flying indoors, as one can observe the effects of the slightest adjustments which encourages a fuller understanding of aerodynamics.

Open Class (*8 flew*) – 1. M. Fantham (Richmond) 67+55—122; 2. K. Brown (Richmond) 60+58—118; 3. S. Philpott (Whitefield) 56+54—110. **12in. Class** (*10 flew*) – 1. M. Page (Peterborough) 52+46—98; 2. C. Edge (Welland Valley) 47+45+(42·5)—92; 3. P. Ball (Grantham) 49·5+42·5+(41)—92.

Sweepette warm-up winners left Mike Page 12in. class and Mike Fantham Open Class. Black spot is Plasticine weight on wing.

JULIAN HOPPER

Last year Julian Hopper produced some flying which apart from creating definite spectator appeal, won him a string of major power events. I was interested to hear what things he had to say about the hobby and his attitude to flying, so last month I went up to visit him.

He lives in a pretty bungalow in Essex miles from anywhere and extremely difficult to find, and explained that it was some nine years ago when an errant trimming flight from a local aerodrome landed in one of the elms which now form the view from his living room window. The house then was overgrown and derelict but Hopper determination soon got to grips with it and he now has a spacious and comfortable home for him and his wife Lynn and their son of just over one year.

Surprisingly, around the house there is no trace of modelling mess, you wouldn't imagine a flyer lived there, apart from cupboards and shelves crammed with hardware won over the last ten years. The answer is that models are stored on racks in the loft and his building is done outside in a 22ft caravan bought solely for the purpose which sits in the drive. This was necessary when the baby came along last year when the spare bedroom was required. It has not been unusual for him to spend complete nights in the caravan oblivious of the time, to wander back into the house at dawn after having completed the urgent component or repair.

He has been interested in aeroplanes since before he can remember and throughout his youth converted each school he attended to aeromodelling. It was a compulsory subject when he was around! At 16 he founded the Stanstead club which started as a couple of mates recruited to watch him fly. Today the club has a membership of over 90 and a waiting list to join! Julian was quick to point out the attraction is no longer him but rather the facilities, as they have the exclusive use of the local airfield – Debden. Incidentally 80 per cent of the membership are radio flyers and Julian has less and less to do with the administration now.

For his first years of aeromodelling his sole contact with the rest of the country and the state of the art was through the magazines. It wasn't until he was in his early teens that he first attended a contest – one of the Hornchurch galas run in the mid sixties at Chobham. Since then he has been successful in Rubber and Power and to a lesser extent Glider. In fact his A2 gliders represent his sole venture into FA1 flying. He has no inherent dislike of FA1 although he objects strongly to the fashionable attitude that it is the ultimate. He doesn't believe this and derives more satisfaction from the British Open circuit than he thinks he could from the UK and European FA1 one. Moreover, he believes that he couldn't do them both justice, particularly in power, on which he spends a great deal of time on the models between events.

He is lucky having Duxford and Bassingbourn within a short drive but it is at his local club field of Debden that he does his trimming, lots of it. With his main class power now, he reckons that at the height of the season it would not be unreasonable to expect him to be trimming at least three nights a week, particularly if he has a problem with a model. He admits that were it not for having to earn a living he could happily become a full time aeromodeller. Incidentally, Julian has his own motor body and repair business and also works for a local firm selling trade vehicles.

He assures me, however, that although he flies as much as possible he doesn't consider it flying purely for fun. Not that he doesn't enjoy it but there just has to be a goal, he has to be improving something, trying something new or sorting out a problem, otherwise his concentration slips and errors occur. It is this concentration upon which he lays a great deal of importance, particularly now he is handling fast and critical machinery. You will rarely see him trimming at a contest as he finds other people distracting.

Up to the Nationals of '76 his stock in trade were his Super Tigre models which had been a familiar sight around the country's contests for years. Before the '76 Nats a major development took place and he embarked upon the first of his 40cu.in. powered Superjacker models. After having managed for years to keep a ceiling on the price of his power plants to around a fiver each, this was going to be an expensive diversion even if it was successful. He didn't go into it blind either, but studied the 'market' for a couple of years before drawing up the first design. As we all do he got behind schedule with the model he had promised himself for the Nats, and he took a month off work to finish and trim it. During the week immediately prior to the contest he would get up every

Julian Hopper 1977 Nats Fly-off Open Power 40 model. Model bunted and blew up in mid-air.

morning before dawn, drive with the model to Debden and wait for the light. Then if it was calm enough he began trimming. It took six days of this to fully sort the model and its first contest flight was its spectacular fly-off victory at the Nationals a few days later. The development had started.

His present stock of models is rather depleted compared to the array he came out with at the start of the '75 season. Then he boasted 11 trimmed power models, his Super Tigre fleet, of which he broke nine during the year. He still considers it to be mechanical failure that gives most of his problems in power and now he checks lines and stress points over and over again between flights and operates a strict replacement system when fittings and hardware become 'time expired'. He has been known to change the wing bands between flights.

When a new model is finished it is check flown repeatedly to see if it is altering before being risked on a comp flight – the '76 Nats was an exception. Wings are not strapped down on jigs or such like. In fact when I looked around the workshop both Superjackers were there with their wings casually propping up the wall. After a contest models are religiously inspected and any parts that require attention put aside for work at the earliest available moment. All models are transported in boxes into which they are loaded before leaving. The seven foot span models have posed a problem in that respect as Julian has no box big enough. If he did have then it wouldn't fit in his Cortina Estate, also bought especially for the modelling trips. His plans are to construct a trailer to tow behind the car as although the big models were planned originally for fly-offs only, he has decided to go the whole hog and use a fleet of them for the flights as well in future, so half a dozen more are envisaged!

He admits to having found power very demanding and is now quite prepared to go to any lengths to master it completely. His biggest problems and often most spectacular errors have occurred in fly-offs and it is only with a systematic checking system that he is now beginning to eliminate them.

Apart from the indefinable driving force that seems to grip top contest flyers he hangs a great deal of importance in competing in and winning major events – SMAE ones in particular. He puts this down to having been brought up to believe that SMAE events were the most important and not just because they usually attracted the largest entry. Of all the single things that contribute to success, the positive, no nonsense, attitude seems to be a vital part of him. Talking to him off the flying field brings one to believe that here is a fellow who won't be beaten by anything and goes about his building and flying logically and with little of the fanfare that could accompany a person in his position

CHRIS BATTY'S OPEN RUBBER MODEL

This design first saw active service around the start of the '76 season. Chris went on to do very well with it in his first contest season at Open Rubber, winning a number of major events including the Nationals '76 at his first go and following it up with a third last year in the same event!

The model has already notched up a number of wins this year including the first SMAE Area Open Rubber event when he had substantially worse weather in the West than in most of the country. On this latest occasion he informs me that it actually did considerably more than its o.o.s. official fly-off time of 5.40 and went further downwind than he could manage on a bike before dark. Returning next day to look further he spotted the model just in time to see the wing blow off and smash itself through a fence. This after it had sat peacefully in the field for nearly 24 hours!

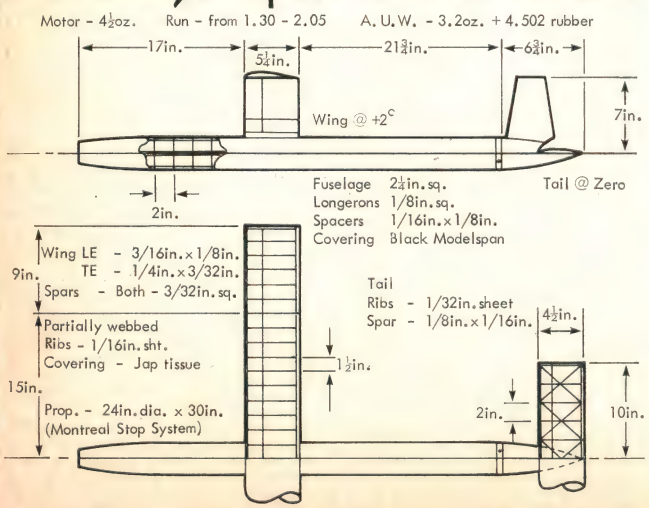
There are certain details he wouldn't give me – like the length the motor makes up to – but as he uses a very similar configuration to me, I would guess at around 52in. It is certainly well powered for a light medium sized model but above all it is extremely simple. Chris says he normally plots his wing sections by drawing round his thumb.

With no geodetics in the fuselage he checks very carefully for tissue damage before winding as a great deal of strength comes from the modelspan covering and the all up weight of this component is only fractionally over 1oz. The model in the photo was used to win the Crookham Winter Gala at Bassingbourn and uses the earlier straight ribbed, high aspect ratio tail which he explained has been prone to warp and change trim, hence the fully geodetic and lower aspect ratio version on the drawing.

The ingenious device anchoring the rear peg attaches to his car door handle and takes the pull-strain off his able helper and allows her to concentrate on supporting the aeroplane. It would also eliminate that annoying backlash lurch that everyone gives, no matter how experienced, when a motor blows. More often than not damage occurs at this moment. If you are thinking of using a system like this it isn't a bad idea to make sure the handbrake is on!

Chris Batty winds during the Cookham Gala earlier this year which he won, note bracing straps on rear motor peg.

Chris Batty's Open Rubber Model



TRIMMING HAND LAUNCH GLIDERS

The following is written for right handed flyers, if you are left handed, reverse all asymmetric adjustments and launch instructions (i.e. read 'right' for 'left' and vice-versa).

The flight pattern that I use for my hand launch glider flying is best described as right-left. The model climbs in a spiral to the right, recovers to the right and then glides in left turning circles. See the December 1977 *AeroModeller* for a plan of the type of model I use.

The following design features are built in during construction:

Zero-zero rigging of the wing and tail, the flat undersides of the surfaces are parallel. The fin is set at 1–1½° incidence to the fuselage centre line, to give a left turn. The tailplane is tilted 4–4½° right tip down, again for a left turn. This results in the tail being parallel to the left inner wing panel to make for easy alignment and checking. If the balsa for the wing is going to come out with one side 'heavy' I make sure that it is on the left so that any turning tendency is favourable. Washout, if used, is the same on both tips.

Trimming procedure falls into three distinct phases and should be carried out over the proverbial long grass on a calm day. This will save time on retrieving and repairing and provide a better chance of assessing the model without interference from turbulence.

The first phase of trimming is to establish a smooth left turning glide by gently launching the model from shoulder height on a slightly downhill path. Start with the CG (centre of gravity) at about 60–70 per cent of the wing chord behind the leading edge. Stalling is corrected by moving the CG forward (add weight to the nose). Diving, or too fast a glide, is cured by moving the CG aft (remove nose weight). The turn is adjusted by bending the trailing edge of the fin toward the desired direction. Aim for a flight circle diameter of about 50–75 feet, with a smooth glide just faster than the stall. Remember that moving the CG aft slows the glide, but do not overdo this to the extent that a stalling tendency occurs. In a stall, the model will slow down, raise its nose, and then the nose will drop suddenly as the model tries to regain flying speed.

The second phase of the trimming is intended to refine the glide and check the stability of the model before risking full power launches. The aim is to get a zooming climb to about 20–30 feet followed by a transition and a smooth glide down. To achieve this, the model is launched at a speed considerably higher than the gliding speed but by no means at full power. Launching the model about 30° nose up with about 30° *left* bank should produce the desired effect. If you launch too steeply or with insufficient bank, a stall will occur. If you launch at too shallow an angle or with too much bank, the model will turn too tightly or go into a spiral dive and may not recover before hitting the ground.

If the model pitches nose up when given a 'hard test glide' as described above, so that it has to be launched in a steep bank to prevent a stall before the glide sets in, it is too stable. The cure is to move the CG aft and bend the trailing edge of the tailplane down. Make such adjustments a little at a time, say $\frac{1}{32}$in. edge movement at the most, and have several flights between changes to see the effect. A piece of plasticine about half the size of a pea will significantly alter the gliding speed of a typical model.

If the 'hard test glide' causes the model to go on at the launch angle with no tendency to pitch nose up, or even results in a nose down manoeuvre, the model is not stable enough. This time the cure is tail trailing edge up and CG forward. The correct trim will result in a zooming climb with slight nose up pitch from a banked 'hard test glide', with perhaps a slight stall as the model slows to gliding speed before making a side-slipping transition into the glide circle. Throughout this 'hard test gliding' phase, the glide trim is adjusted with nose weight changes and fin trailing edge movements.

Once this type of launch and flight pattern has been established, a further assessment of the stability is possible by launching the model with less left bank or slightly faster to cause a stall at the transition, when the nose will drop. If the model does not pull out of the dive before it hits the ground it is not stable enough, so bend up the tail trailing edge. This will create the need for more nose weight to prevent the glide being slowed. If after the stall induced as above, the model pulls out sharply, it is too stable so CG back and tail trailing edge down. As a guide, the model I fly will just about pull out of a 45° nose dive from about 35ft altitude when it is fully trimmed.

In practice the assessment of pitch rate during climb and stall recovery go on at the same time, both behaviours being noted on each launch.

If the 'hard test glide' type of launch causes a roll to the left or right, which gets worse as the speed of throw increases but the model turns normally during the glide, suspect a wing warp that is not equal in both halves of the wing. Wash-in (more incidence) on the left side or wash-out (less incidence) on the right side would, at high speed, cause a roll to the right and vice-versa. To cure this, you can remove the offending warp, if one is present, or adjust the rudder. Some flyers introduce a warp to cause a right roll which can help the climb pattern and prevent spinning-in on the glide. If you adjust the rudder you will, of course, alter the glide turn but this can be re-established with wing tip weight, the model turns toward the heavy wing, or tail tilt changes. Tail tilt tends to affect the 'powered' part of the flight much less than the glide but there is some cross-connection. Remember that the effect of tail tilt is to make the model turn toward the high side of the tailplane so that a bank in the turn direction would tend to level the tail.

When you are happy with the 'hard test glide' performance of the model you can go on to phase 3, the full power launches. The launch is made with *right* bank and nose up. The angles will vary with model design and exact trim state but as a guide I aim to throw the model with about 30° right bank and about 40° nose up. It is sometimes useful to have some imaginary 'target' in the air to aim at, indoors you can use a mark on the wall. Run through the launch action making sure that the model will be at the correct angles when it reaches the 'let go' point. Make sure you get a very firm and comfortable grip on the model and hold it very tight. Add small patches of sandpaper at the grip points if you feel this will help.

Don't worry too much about the number of steps of run-up that you use to launch. Some flyers run a fair distance then almost stop to launch, others more or less stand still. The run-up does two things; first it gives a bit of extra launch speed and secondly it aids the rhythm of the launch. Don't try to run flat out because you won't be able to control the launch angles consistently. Use a run-up and throw which are comfortable and natural and follow through like throwing a ball but not bowling it. In other words let your hand continue in the direction in which you intend the model to go. Try to warm up your arm before making full power launches to avoid strained muscles and improve performance. The 'hard test glide' technique has the advantage of being a good way of warming up and checking the trim at the same time. I use this indoors having a few 'hard test glides' before each series of contest flights.

So make your first full power launches and watch the results carefully. The pattern I aim for is a steep spiral climb to the right such that the model runs out of speed in a steep right bank with the nose well up after about half a turn in the spiral. A side-slipping transition to the glide then occurs, to the right, and then left turn takes over for the glide down. This places the flight circle during the glide behind my right shoulder as I face in the launch direction. Pitch and roll adjustments to achieve the correct pattern are to some extent linked, more pitch and more left roll lead to a tighter spiral which requires more bank angle at launch. If your model climbs into the correct steep right bank at transition but stalls badly try launching more nose up or bend in some slight up elevation and increase noseweight. If the model goes through the transition too fast and loses height or even tries to loop, the cure is less nose weight and down elevator, or perhaps a more shallow launch angle. Roll is controlled by the methods discussed before, rudder and wash-in or wash-out, remembering to re-trim the glide turn with tip weight or tail tilt. Some flyers use tailplane twist to trim and I do this to some extent by bending only the appropriate half of the tail up or down to make roll and pitch adjustments simultaneously. To cause nose down pitch and left roll, I bend down the right side of the tail and so on.

Well there it is. I've mentioned a fair number of adjustments you can make to a simple wooden glider and there are probably others. Try various combinations in the ways that I have suggested next time you trim a model and you should be able to get somewhere near the flight pattern described.

The field for experiment is enormous; here are a few random thoughts to be going on with:

Is there an optimum weight for a model? Heavy gliders go higher light gliders glide better. Should you throw upwards for more height or horizontally for more speed? How much dihedral, aspect ratio, fin area, and tail area should there be? Does a polished finish help? Do I really need to train and do press-ups, run ten miles and chop a tree down each day before breakfast?

THERE IS an increasing choice of paint types available to the modeller, each with different chemical and physical properties. It is as well to be aware of these characteristics to be able to avoid the paint chemically attacking the undercoats and fillers used in preparation or indeed even the very materials used to construct the model itself. The corrosive effect of fuels and exhaust emission may well require further proofing to extend the life of a model. Familiarity with all these characteristics will enable the modeller to achieve his specific requirements and take advantage of the excellent finish possible with today's paints more easily and quickly.

Fifth instalment of a detailed series on the use, choice and techniques involved in spray finishing by IAN PEACOCK

Most of the conventional paint finishes are suitable for spray application and considerable weight savings may be made. As a rule of thumb guide savings of between ½oz per sq ft and 1oz per sq ft are common, dependant on the material used. In general terms, several thin coats are better than one thick coat, however one should check with the manufacturers' instructions concerning multiple coats and any specific drying time between coats.

Some specialist colour finishes such as fluorescents, used to improve visibility on F/F models, can really only be applied properly by spray. Not only is such a finish smoother and therefore, more highly reflective, but substantial weight savings can be achieved.

One of the less obvious materials to put through your spray gun is water. Water shrinking tissue covering is still a prime tautening method and the control available from a spray allows a much finer control. The airbrush allows very precise areas, such as on a peanut scale model, to be singled out for individual attention. To many modellers, though, 'paint' is the prime finishing material and here is a brief resume of some of the types available.

Dopes

Cellulose dopes have long been the established finishing media for all model aircraft, even early full size aircraft depended on dope to seal the fabric covering. Clear shrinking dope is used to seal the pores in the tissue or nylon, making it airtight as well as tautening it. It also produces the prime base coat for subsequent colouring, colour dopes colour but do not tauten. One problem when spraying dopes too thick to penetrate the covering, is that a skin is formed on the surface rather than filling the pores. Shock loads applied to the airframe, from rough landing, can cause this skin to break free from the covering material, silk and nylon are especially vulnerable. Colour dopes, due to their rapid drying properties, are normally difficult to apply by brush, and are more easily sprayed.

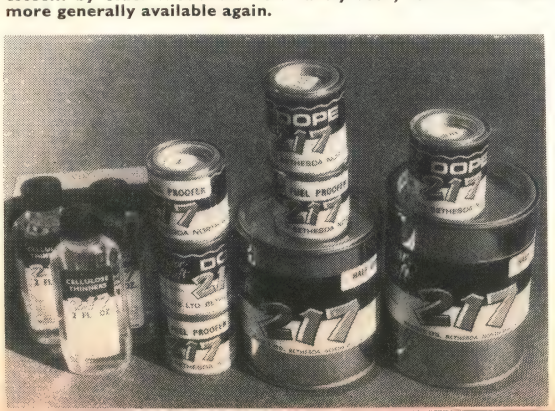
Many manufacturers come to mind, such as Humbrol and Keil Kraft, together with many other established products like Titanine and 217 which seems to have disappeared from all but a few shops. An odd situation considering the high quality of these products and the reputation held with older modellers. Wider distribution of their products is soon to be expected, apparently if modellers were to only ask for what they want rather than putting up with 'not made any more' platitudes, a still wider range could be made available. It would seem, for instance that authentic camouflage dope *is* made but not distributed because the makers don't know what is needed!

Colour cellulose used in the motor car refinishing industry is also suited for modelling, being in fact sophisticated colour dope! A visit to a local dealer in this business will reveal a colour choice of hundreds of shades, 1 litre (1¾ pints) is very often the smallest can size stocked. Standard cellulose thinners essential for spraying and cleaning may also be obtained from the same source for around £2 per gallon. A 50/50 dope and thinners mix is usually a good place to start, dependent upon brand of dope, type of equipment, ambient temperature etc.

Colour dopes may be applied over clear dope, sanding sealer or car body primer but should *not* be used over enamels as the result is to 'pickle' the enamel causing a blistered crazy paving like effect. Most colour dopes have a gloss finish but some brands also produce matt camouflage colours, having an even shorter drying time. Neither gloss nor matt dopes are fuel proof and require a final coat of fuel proof lacquer for engine powered models.

Dope applied to either expanded styrene (foam wings etc) or rigid styrene (plastic kits) will react with the plastic dissolving large areas. Despite increasing use in flying models of ABS vacuum formed plastic parts, dope will

Range of Dope Products from 217 and Titanine held in high esteem by older modellers now rarely seen, soon to become more generally available again.



not adhere properly to it, and no amount of rubbing up to 'key' the surface will help either, making it potentially impossible to dope a mixed plastic and balsa model. The dope simply flakes off. Maybe kit manufacturers should do more homework! It is always a good idea to ascertain the compatability of the finish with sample scraps of such materials first, before risking the model itself.

Having said all that one can, with practice and expertise, bend these rules. Many an expert now uses dope on plastic kits, despite the earlier warning. A good airbrush enables dope to be applied so thinly that the solvents evaporate and the dope dries before it attacks the surface of the plastic. Dope does not fingermark so easily and its rapid drying removes the possibility of dust settling on its surface, often producing a better finish.

Enamels

This group of paints is the other standard model finish, being most usually associated with the ½oz tinlets from Humbrol which includes many specialist colours. Other names include Testors and Pactra from the USA or Joy and Gloy from this country. Enamels are not usually touch dry in much under an hour and will often require 6-12 hours to harden compared to minutes for cellulose. Slower drying is of more use when brushing, but offers no advantage when spraying. White Spirit or Turps substitute makes an ideal thinning agent, again a 50/50 mix is a good mix to start. Conventional primers, dope and sanding sealers are all suitable undercoats. The pickling mentioned earlier does not occur when applying enamel over dope, only the other way round.

The longer drying time necessitates dust to be kept to a minimum. Also beware of fallout, particles of enamel present in the atmosphere from overspray will land on furniture, other nearby models etc, whilst still wet and it is difficult to remove this haze when dry. Enamels are tougher than dopes, but despite claims to the contrary, are not really fuel proof. If the model is expected to last any time, some exterior layer of fuel proofer is advised.

Many of the traditional household paints, Crown, Dulux, etc, are enamels and may be thinned to spraying consistency. The 'dial-a-colour' style of blenders at DIY stores can produce ½pt or so of exotic colour to make one's model stand apart from the majority.

Polyurethane

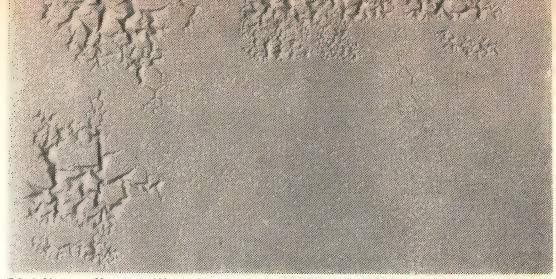
Most good polyurethanes are of the twin-pack variety, that is to say they contain a resin and a hardener in separate tins. When mixed together a chemical action takes place producing a tough finish. This action may be speeded up (within limits) by heating or slowed down by cooling. They are not dependant solely on evaporation to harden as in the case of cellulose and enamel and once mixed the action is irreversible. Two part urethanes are generally fuel proof. Special thinners are required for urethanes and, like all twin-part, chemically activated paints must be completely cleaned from the spray gun or airbrush while the paint is still wet. Boat chandlers are a useful source for bulk buyers.

Acrylics

Probably new to most modellers, acrylic paint is an alternative to cellulose, tried in the mass produced motor car industry a few years ago. New and improved acrylics in two-pack forms are now available and these are worth considering. Acrylic is a plastic based paint like polyurethanes, which has a particularly high gloss and 'plastic like' surface finish. These new acrylics are available from most motor car refinishing agents, most of which use colour mix units to supply any colour and quantity from an eggcup full upwards!

Metalflake acrylics of US origin are much favoured by

Plastic kits by John Ellis finished by spraying with coloured dope. Not normally recommended but with care produces better finish.



Pickling effect will ruin any finish due to overpainting incompatible finishes. Above, dope applied over enamel, lesser effect produced over acrylic.

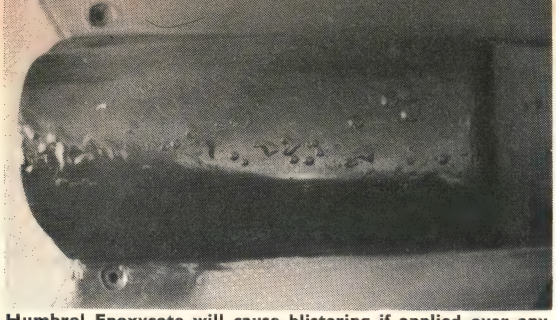
custom car enthusiasts. The range includes primers and fillers, translucent and opaque colours and many special finishes with exotic names; Candy Apple, Pearl, Flip-flop, Eeriedess and Metallics all in their own way produce startling effects. The UK distributor is a keen R/C modeller and has agreed to make the entire range available in the smaller sizes to suit our hobby, details from Denis Ferney, Calbrook Cars, Commerce Estate, Kingston Road, Leatherhead, Surrey Please enclose an SAE.

The use of such finishes will be dealt with in the later customising chapter while the July issue of *Scale Models* features Ray Hapgood's use of these acrylic metal flakes. Acrylics may be applied over dope or primer preparation allowing adequate time to dry out, but are best not used over enamel as a surface reaction may set in.

Epoxies

Epoxies are renowned for their strength and tough finish, they are 100 per cent fuel proof and require no other protection, and like the adhesives they are all two-part. Most epoxy paints are effectively just thin adhesive, sometimes coloured. Humbrol's 'Epoxycote' paints match their ranges of dopes and enamels and plastic-film covering which is a useful point when finishing 'mixed material' models. Epoxycote may only be applied over a clear dope preparation, producing a violent reaction over coloured dope or other paints. It cannot be applied over traditional primers, such as sanding sealer or car body primer. Humbrol produce an epoxy primer which is not generally available through the model stores.

Also available in the UK is the K & B Superpoxy range, marketed by Irvine Engines. The range has a limited number of prime colours that may be mixed to provide intermediate colours. K & B epoxy primer is excellent and may be applied over virtually any modelling finish and sands to a glass like surface in preparation for the top colour coat. The hardener comes in both gloss and matt and a special hardener is available for brushing. A word



Humbrol Epoxycote will cause blistering if applied over any finish other than clear dope.

of caution: the matting agent added to the hardener produces an acceptable 'satin' finish along the lines of WWII finishes, but in so doing forfeits the degree of fuel-proof associated with the gloss colours. I can personally recommend this range, having used it for several seasons without a failure. Clear K&B epoxy may be used as a fuel proofer over other finishes with every success, being more famous for its use in applying lightweight glass cloth. No camouflage colours are available to my knowledge in any of these two-pack finishes, and mix any colours before adding the hardener.

Application

It is best not to mix different finishes on a model as colour matching can be difficult and chemical reactions can spoil the finish. This generalisation on not mixing finishes is a good guide, although mixed finishes are possible for the experienced providing that some caution is exercised. All the materials discussed can be sprayed with the simple equipment outlined throughout the previous months but it is worth checking the manufacturer's instructions for any specific points to be observed. Many of the modern finishes cannot be successfully sprayed in the cold or damp. Epoxies, for instance, should be sprayed at temperatures of about 60°–70°F and at humidities of less than 75 per cent. DO NOT, however, heat your spray area with any form of naked flame, gas, paraffin, coal etc, as there is considerable risk of explosion or fire from the fumes of most paints. Similarly electric fan heaters will kick up the dust which is also bad news If in doubt, warm the workshop to, say, 80°F and extinguish all heating appliances whilst spraying is carried out. Sheets of wet newspaper on the floor, work bench, and even hung from the walls will help to keep the dust down, at the risk of increasing humidity.

Most paints have a distinctive odour – many of them being quite pleasant and even addictive. Some however, Epoxies and Urethanes among them, are extremely obnoxious and may even be injurious to the health if encountered in any great quantity. *Always* wear a mask, particularly when spraying in a confined area, and drink plenty of milk – not with the mask still on, stupid.

If you start to feel sick or dizzy, leave off at once, get plenty of fresh air, resume spraying another day. Ensure good ventilation, bearing in mind that a through draught will stir up the dust and lower the temperature. Airbrushes consume far less material and consequently fumes are less of a problem.

Fuel Proofer

Not all popular finishing materials are fuel proof and a coat of clear fuelproof lacquer is needed as a final protection. Many specialist products are marketed for just this use 'Humbrol', 'Joy', 'HMG', '217' produce single pack products which can be sprayed with comparative ease.

A two-pack product made for the furniture industry and marketed as *Furniglas Hardset* is available from Ripmax stockists under the *Tufkote* label. This is another twin pack proofer, which dries quickly to an incredibly hard, high gloss finish, but like other two-part products gives off pretty obnoxious fumes. Unlike some other fuel proofers, it does not 'yellow' with age.

A must for spray painters, these face masks allow clean breathing in atmosphere full of paint particles.

Attack to paint finishes comes not so much from neat fuel as from the exhaust residue which is far more corrosive and often hot. This is where many products fail to protect the model. This poses a certain problem to the serious warplane enthusiast, who searches for a matt finish as few of them are fuel proof.

Masking

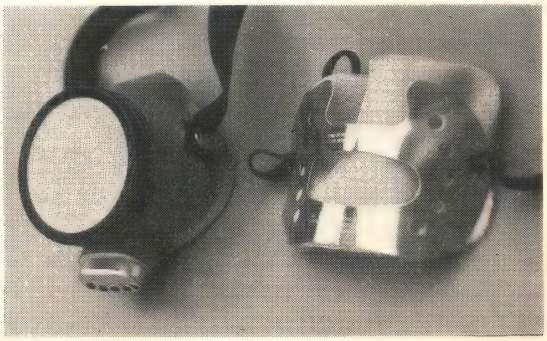
When contemplating multi colour schemes, various methods of masking are needed, such as masking tapes, masking films or liquid masks. Most modellers will be familiar with the crepe paper masking tapes although PVC electrical tape is equally good, having a low tack adhesive, a good clean edge and the ability to negotiate gentle curves. Masking tape laid sticky side down on a sheet of glass first helps to reduce the tack and may be trimmed to shape whilst still on the glass. However, for the really compound curves or for fancy pin-striping, narrow tape is needed. Denis Ferney also stocks a wide range of tapes from $\frac{1}{16}$in wide. Once the edge is defined with tape, more general masking can be achieved with newspaper.

Masking film may be new to many aeromodellers but it is an established product in the art world. Among the better films are *Frisk* and *Magic Marker* although I believe that Badger, via Morris & Ingram, are now producing a similar product. These films have an amazingly low tack adhesive allowing the film to be easily removed from the most delicate surface Careful cutting with a sharp balsa knife will enable the most complex masks to be made with ease. A cheap alternative to these films with a higher tack adhesive may be found in stationers under such names as *Transpaseal.*

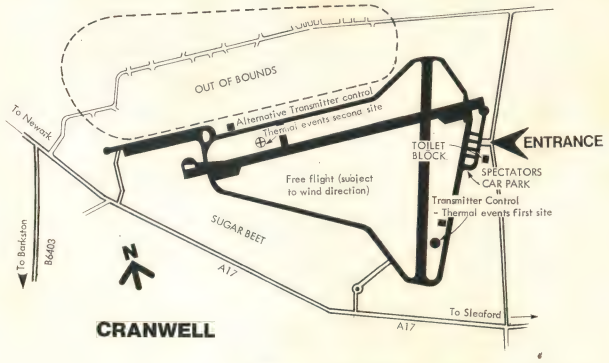
Liquid masking is usually reserved for those small, fiddly areas or excessively complex curves that cannot easily be done any other way. Areas such as cockpit canopies on plastic kits comes rapidly to mind. Humbrol produce *Maskol* and *Maskex* is marketed by Precision Paints.

Most of these liquids are water based latex, lightly coloured for visibility in use. They are applied by brush to the inhibited areas and peeled off when spraying is completed. *Copydex* also works well with a drop of food colouring added. Whenever masking is used, no matter how carefully one presses down the edge, there exists the possibility that paint may 'creep' beneath the mask. To overcome this problem, once the mask is in place, lightly spray over the edges with the base colour, then any creep will be the colour that is already there and will not show. This thin spray therefore, seals the edge and prevents the second colour from creeping under. When removing masks, never pull them away from the model at right angles but double them back on themselves and pull along the tape at 180°.

Next month – Custom spray your model. Basic lessons for airbrush users, how to get to grips with techniques.



BRITISH NATIONAL CHAMPIONSHIPS



THIS YEAR we once again return to a split site Nationals R/C, C/L and Scale at RAF Barkston Heath with F/F and R/C Thermal Soaring at RAF Cranwell. Both airfields are within a few miles of each other just north of Grantham. A camp site is available at Barkston Heath. It caters for both sites with access from 12.00 hrs Friday 26th. The charge rate for the period is £3 per person collected on site, accompanied under-14 year-olds free, unaccompanied 50p.

Cars must be kept off both grass and main runways. Perimeter tracks are available for access and car parks are designated, with priority given to competitors. Dual entry for both sites is at the rate of £1.50 per car per day for spectators. Trade stands will be located at Barkston Heath.

27—29th MAY

SCALE *RAF Barkston Heath* (Contest Director J. Adams)

Saturday May 27th

9.00 hrs.	R/C briefing
10.00-16.00 hrs.	R/C Class I and II
17.00 hrs.	F/F briefing
18.00 hrs.	F/F/ Class I

Sunday May 28th

7.00 hrs.	F/F alternative
10.00 hrs.	C/L Scale briefing and flying
10.00-18,00 hrs.	R/C Class I & II plus Static
11.00 hrs.	F/F CO_2 & Electric
18.00 hrs.	F/F Class I

Monday May 29th

7.00 hrs.	F/F alternative
9.00-13.00 hrs.	R/C Class I & II plus Static

CONTROL LINE *RAF Barkston Heath* (Contest Director Bob Horwood). Location Runway 11-29. Two safety cages will be in operation shared between Racing and Speed Events.

Saturday May 27th

8.00-19.00 hrs.	Goodyear, B. FAI and ½A Racing
8.00-19.00 hrs.	Combat
8.00-19.00 hrs.	Stunt
9.00-16.30 hrs.	Speed

Sunday May 28th

8.00-19.00 hrs.	Goodyear, B, FAI, ½A Racing
8.00-19.00 hrs.	Stunt
8.00-19.00 hrs.	Combat
9.00-16.30 hrs.	Speed

Also Mini Goodyear, ½A Combat, Novice Stunt.

Monday May 29th

8.00-14.50 hrs.	Goodyear B, FAI, ½A Racing

Finals from 13.35 hrs.

8.00-15.00 hrs.	Speed
12.30-15.00 hrs.	Stunt
14.30 hrs.	Combat Final (¼s and semis in morning)

Also ½A Combat and Novice Stunt.
Prizegiving R/C and C/L 15.30 hrs. Monday 29th.

FREE FLIGHT *RAF Cranwell*, (Contest Director Dave Hipperson) Main Control Van situated at upwind end of airfield, access from 8.00am.

Saturday May 27th

10.00-19.00 hr. Open Glider, Open Power, Coupe d'Hiver, Hand launch Glider. Flyoffs 19.30 hrs, Prizegiving 20.00 hrs.

Sunday May 28th

8.00-12.30 hrs.	F1A, F1B, F1C, ½ hour sequence first 3 rounds
12.30-19.00 hrs.	Open Rubber, ½A Power, A1 Glider
15.30-16.00 hrs.	CO_2 Scramble

Fly-offs 19.30 hrs.
Prizegiving 20.00 hrs.

Monday May 29th

9.30-15.30 hrs.	F1A, F1B, F1C, ½ hour sequence remaining 4 rounds.
11.00-15.00 hrs.	Junior Kit event Rubber and Glider

Fly-offs 15.45 hrs.
Prizegiving 20.00 hrs.

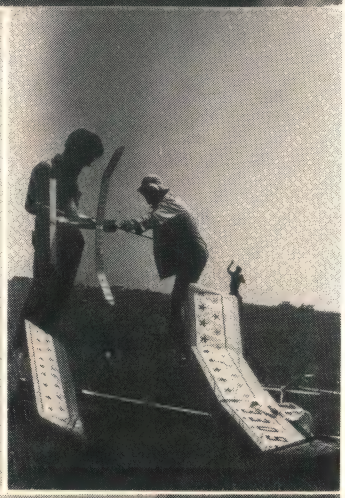
No *unofficial flying after 15.30 on Monday.*
No *prolonged ground running of engines*
No *vehicles on main runways; push-bikes only.*

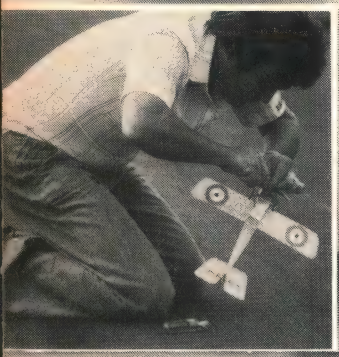
Junior Kit

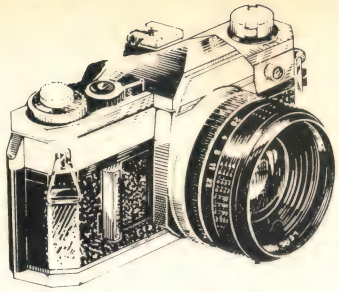
To be held at RAF Cranwell, on May 29th.

The competition is open to anyone under 16 on January 1st 1978, and any glider or rubber-driven model they have built from a kit is eligible, as long as its wingspan is less than 50 inches. The contest is simply for flight duration; the gliders can be launched with up to 50 metres of tow-line, and three flights are counted, each timed to a maximum of two minutes.

Separate classes for gliders and rubber models, both have an extensive prize list of model kits, materials and equipment. Entry is made on the day free of charge.







MODEL PHOTO COMP

Photography is a natural way of capturing the skill of the model builder or the excitement of a day's flying. Whether the interest be scale replicas aiming for realism, performance models with bags of action or just enjoying the relaxation of sports modelling, photography is always a common interest.

This year, by a remarkable coincidence, sees Three World Championship events here in England for Control Line, Scale and possibly Indoor models. Hundreds of competitors will be visiting England literally from all over the World to provide a unique opportunity to improve your photography and form a valuable record of the year's events.

You'd be surprised how many photos we receive from readers, of their latest model or a flying meeting they have attended, yet so often the modeller is disappointed by poor results from his camera.

Expensive and complex equipment is not necessarily the answer and can often lead to greater confusion unless in the hands of the true photographic expert. Over the coming months we will be featuring a series of short articles, written by well known model flyers, aimed at describing how to overcome these basic problems, to help you produce better photos and understand how to obtain better results from your own equipment.

To offer you the chance to share your favourite photos with our readers, *Aeromodeller* now announces its **"Model Photo Competition"** with the opportunity to win fabulous prizes that will help you enjoy your photography even more. Colour Slides and Black and White prints are the two main categories for static or action shots. Due consideration will be taken for composition, chance, enjoyment, humour, drama as applicable to each photo.

Bear in mind that your photo could well appear in these pages and so choose subjects that you feel will be of interest to other readers. Naturally the readers will also be interested in hearing of the details of your chosen subject or a brief explanation and caption as required.

Our only opportunity of reproducing colour work at the moment is on the cover itself, which offers a marvellous opportunity for the best entries. Do, therefore, make allowance for the space taken by our *Aeromodeller* title; for example the top fifth of the frame should normally be free of subject matter or distracting detail in colour shots.

The competition will run throughout the Summer months to allow readers to make the most of their visits to flying events or to hurry up and finish that long running building project. Start thinking about your entry now, don't leave it all until the last minute and if you've already got some good photographs to hand, you can send them in right away.

Top: Dramatic natural back lighting of Reg Parham inside the Cardington Airship hangar in this otherwise dark interior, highlights the fragile model and the anxious modeller.
Above left: Carburetter has only top rim in focus due to limited depth of field. By closing the aperture and using longer exposure with a tripod if necessary, the whole subject would appear sharp.
Above right: Interesting composition of an idyllic day's flying, wide angle lens with greater depth of field allow model in foreground and distant cars to all be in focus. A second or two delay would have allowed the towline glider flyer to run into a more favourable position.
Below left: Man and Machine. Splendid contrast in scale as a modeller crouches over his diminutive CO_2 powered Bristol Scout peanut scale model, shown up well against darker runway background.
Below right: Detail of sprung hinge tail plane mount uses light and shade to good effect, strong sunlight also makes hidden rib spacing visible through sheeted tail under surface.
Bottom: Fast shutter speed freezes the action during a high speed pit stop, but too wide an aperture results in only the hand being in focus. A faster film (of higher ASA rating), being more sensitive to the light, allows both faster shutter and smaller aperture for such occasions.

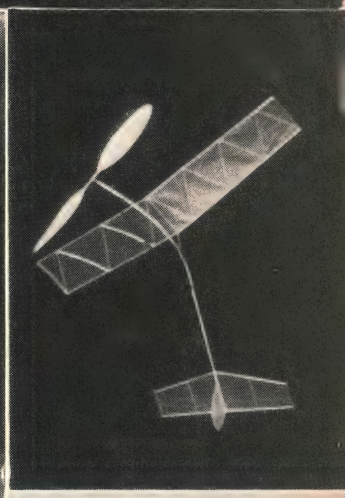
L O ETITION

☆ Win Super Prizes

RULES

1. *The theme of the competition is to select the photograph judged to be the best pictorial presentation of Aeromodelling. All submissions must be certified as the work of the entrant, by signature on the rear face or mount.*
2. *There are two competition classes:*
   (*a*) *Colour slides which should preferably be vertical format 35mm, or larger.*
   (*b*) *Black and white prints of any size up to 10×8ins., negatives need not be provided.*
3. *The following information must accompany each entry:*
   (*a*) *Sender's name and address,*
   (*b*) *full details of the model, location, builder, event,*
   (*c*) *title or caption.*
4. *Entry is free. Each entry (however many pictures it contains) must be accompanied by a contest coupon taken from an issue of* Aeromodeller *magazine. There is no limit to the number of entries that may be made – but remember that quality will count, not quantity.*
5. *Clearly mark the entry "Model Photo Competition" and send to* Aeromodeller, *13-15 Bridge St., Hemel Hempstead, Herts.*
6. *Proof of postage cannot be held as proof of receipt by* Aeromodeller. *While every care is taken of material received, this journal cannot take responsibility for any loss or damage to entries whatever the cause.*
7. *Entries can only be returned after the judging if suitable postage and packing is provided.*
8. *The Judges' decision is final in all matters and no correspondence can be undertaken in connection with the contest.*
9. *Entry to the contest implies full acceptance of all rules.*
10. Aeromodeller *reserves the right to publish any photo during or after the contest. Copyright of all entries rests with the entrant.*
11. *Closing date for entries 29th September, 1978. Winners will be announced in December* Aeromodeller *on sale 17th November, 1978.*

Prizes include: Kodak's latest **EK100 instant camera and film,** with other prizes of **Colour transparency** and **Black and White Kodak film. Instaplus pocket EF1 camera with flash unit** supplied by importers and distributors Paul Plus Ltd, members of the Photopia International Group. Photographic equipment and accessories from Patterson products including a **THERMO-DRUM print developer,** for colour or black and white, **Micro focus finder** and bottles of **developing chemicals** and **accessories.** Other prizes include **Photography Year Books** and **Aeromodeller Annuals** from Argus Books.



Top: Static shot of Focke Wulf 190, has aerial lost along horizon. Lower camera angle would be nearer scale eyelevel and use of flash outdoors (or reflector) would help remove dark shadow under wings.
For candid shots like the next two below, all one can do is have camera set ready for all occasions. A medium shutter speed and the smallest practical aperture pre-set allows camera to merely be pointed and fired. Such an approach captured the collision between two combat models left and the rubber motor distorting an EZB fuselage midway through flight.
Below left: Strong sunlight, deep shadow and reflective surfaces cause problems, polarizing filter would reduce shine from wings while some light on face or fill in flash would help identify subject.
Below right: Runners up at the World Championships Luis Petersen and Jens Geschwendtner pose with their model after the final. Just as the shutter is pressed Jens turns to speak and Luis blinks. It's always a good idea to take a couple of extra shots even of static subjects to allow choice of most favourable pose.
Bottom: Autogyros or rubber models with slow revving propellers are always difficult subjects, slow shutter speed allows blades to blur realistically but model also moves, whilst fast shutter speed freezes blade rotation and destroys illusion of lift.

RACING

by Dave Clarkson

ALL OF us Control Line Racing enthusiasts, whether new at the game or old salts, should concentrate on improving the ongoing techniques of piloting. What follows is based on a discussion I led recently at my club and includes all of the important factors we came up with. We all felt that it was a most valuable session and I hope that it will be new and useful to you all. Correct piloting is a combination of three factors:

Avoiding rule infringements (or being caught). Infringing the rules incurs warnings or disqualification. Neither are desirable for they prejudice success. In writing this article, I have assumed full knowledge of the rules – KNOW THE RULES for there are in FAI Team Race almost 20 different warning/disqualification grounds.

Consideration for other pilots. At the basic level this means not physically interfering with the other pilots in your race such that you are either disqualified for physical interference or cause dangerous near misses etc. At the more 'every day' level it also means showing sufficient consideration that they accord the same to you and everyone can get on with the business of flying.

Obtaining the best results. Frequently it is not the fastest model that wins but rather the fastest pilot. Inevitably this means piloting very close to the limit of actually infringing certain rules. Rules are written to be kept and at many races we now have a team of judges (a jury) to ensure this. However it does you no good if in keeping to the rules, you adopt slow flying techniques. Fast flying techniques are not necessarily illegal; at the highest levels, they have to be legal and are necessary for success – in other words, fast flying is correct flying.

That's the introduction and also the basic principles governing the whole matter. What follows is not intended in any way to qualify or offend against these principles.

Correct Clothes. Simple enough but mistakes here can give problems both for yourself and your fellows. First thing to remember is no hats – hats can seriously restrict the vision of fellow pilots and also interfere with others' lines. Hoods on jackets are similarly unacceptable whether worn over the head or not – the hood hanging behind your back can get badly mixed up with someone else's handle and/or lines. The same goes for thick and/or baggy sweaters – these are the devil for getting entangled with handle connectors. For the upper body, I recommend a shirt and, if necessary, a thin, well fitting sweater and if the weather is cold a smooth surfaced non-hooded jacket like a car rally jacket. Footwear is the final point. I dislike training shoes for they have no protection for your heels and achilles tendon area and none against people stepping on your toes; besides this they have relatively thin soles and your feet can suffer from continually walking or running on hard runways with bruising etc. I recommend light walking boots for they suffer from none of the disadvantages of training shoes and can be cheaper too! If you feel that elevated sole footwear is essential for you to compensate for your lack of inches, do be careful in selecting such. The heel must be no more than 15mm higher than the sole for comfortable (i.e. safe) flying and a wide, flexible sole is essential as is plenty of familiarity in wearing them to ensure you keep vertical in a race – good, tight lacing helps a lot here as well. I use elevated shoes (boy! are they ugly) as described above and have found no safety problems but care is essential – staggering round in the middle is a real no no.

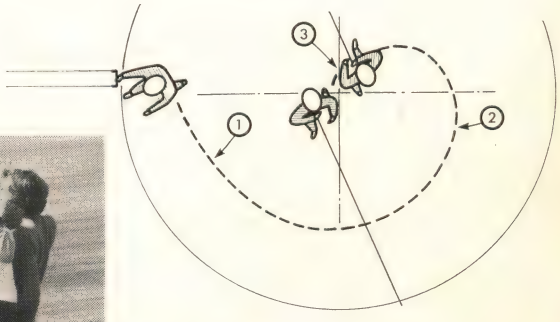
Correct Handle. Small is beautiful with handles. Integration is the word – the handle must integrate perfectly with your hand. All of the problem handles I have seen have been big, unwieldy things with massive lead-out spacings – two fingers lead-out separation is what most people use (the two middle fingers). Small but strong connectors are vital, the small 'Pylon Brand' connectors are perfect for FAI-TR handles. Strength is important too; I know of two crashes last year in races totally caused by handle fractures – you don't think this is possible? Well believe me, it is!

Good General Conduct. All sensible stuff, some of it required directly by the rules. Do remember that during any race, when you are not in the air flying, your handle must be on the ground and you yourself must be right down too, particularly your head. The only sure way of knowing that your handle is grounded is to ground your knuckles so grit your teeth and grind your knuckles on the tarmac – if you don't, unwanted warnings may result. When you have finished your race but whilst others are still completing, get your body including your feet well out of the pilot's circle preferably on the up-wind side of the circle but in any case never – but never – directly in line with anyone's pitting segment; this is a real must, to avoid interfering with other pilots. One final point of conduct concerns announcing your intentions to your co-pilots. The rules require that you inform other pilots when you wish to overtake so you must do this much at least. In addition I recommend you inform your fellows of everything else you intend to do – things like coming in, shutting off etc; this all contributes to safe, trouble-free flying.

The Take-off. The key things to remember are: Run forwards and not backwards; do not whip with the arm; keep your head down and looking at your model; take off low.

Whilst remembering this lot, remember to keep a weather-eye open for what the others are up to and, when you arrive in the middle, do it gently. Nothing can cause more trouble to your fellow pilots than arriving with a big 'bang' and knocking them all over the place.

Normal Level Flight. Watch the best pilots and you will learn a great deal. There are many good pilots in England so there is a lot to study – my hero has always been Derek Heaton and I have learned a great deal from watching Derek; still learning in fact. Things to note are keeping your handle right on, or just under, your chin is, in my view, the best for normal level flight. Any lower and you may get your lines entwined with another pilot's body; any higher and your hand may restrict your own vision – both are highly undesirable.

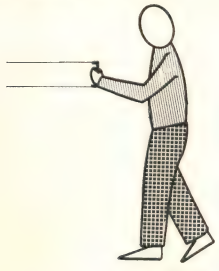


TAKE-OFF, above: (1) Initial run is forwards, flying model low and keeping your head down; (2) Spiral in gently, still running forwards; (3) Get in the middle gently, avoiding hitting other pilots.
Far left: Keep low and a little in from the edge of the pilot's circle until one segment from your pitman. Dave Rudd once more shows excellent technique – this time during a landing. Behind the right shoulder and with the handle as high as legally permitted for normal level flight, Dave Rudd uses the best technique in preparing to overtake John Horton.

Left: On take-off, the first move is forward. Carl Dodge in position one. Middle: Even against a taller pilot, keeping the handle high makes flying over an opponent's shoulder easy – Luis Petersen shows how. Right: Being tall and thin helps! The 'banana' Rylin from Sweden shows his physical advantages compared with Christian Kant – a big girl.

As far as flying height goes, remember that the horizon represents just about the lower limit for legal flying so try to fly *just* above the horizon. Good habits to acquire are to glance at your mechanic each and every lap so as to maintain good communications and also to note site geographical features like trees, buildings etc – airfields invariably have instantly recognisable buildings so you can keep yourself orientated vis-a-vis the jury, your mechanic, the wind etc. My final word of advice concerning level flight is to avoid as far as possible large steps and, most particularly, running. Both of these reduce your effective height and thus compound any blocking trouble you may be suffering. Counter blocking by keeping as close as humanly possible to the offender's back and by holding your handle as high as practicable. Unless constrained to do otherwise, it is kindest to the other pilots and also fastest for yourself to walk small circles. This means walking with small, preferably bouncy steps which, by coincidence, maximise your effective height which is also a plus point for maximum model airspeed. This point about pilot, or more properly, handle height, is important for the higher your handle is, the less lift your model has to generate to remain at legal height and therefore the less drag is produced; as we all know, less drag equals more airspeed and we all want that!

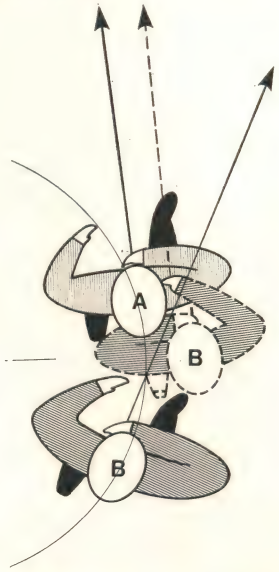
FLYING POSTURE



WRONG

RIGHT

Shoulders back, Head up, Handle High.



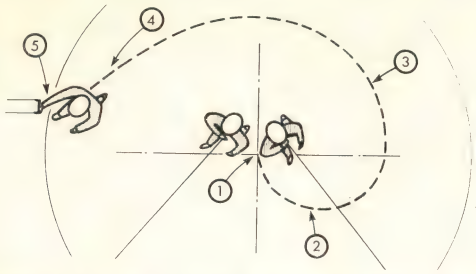
OVERTAKING
Get in as close as possible behind pilot in front.

Overtaking. Most, if not all, pilots will agree that overtaking is the most difficult manoeuvre that we have to perform. This is due to the simple fact that in FAI Team Racing anyway speed differentials are usually pretty small and to get your overtaking done in the three laps allowed for handle-off and back on the chest above 3 metre height flying means you have to be pretty skilful to overtake without offending some rule and getting a warning. The key things to do are to get right behind the back of the pilot you wish to overtake, to get your handle as high as possible (it can now be legally held on your forehead and yet not be classed as handle-off) and finally to keep at normal flying height until your model is very close to the model to be overtaken. The last two are simple skill things that came with practice but the first one about getting right behind the pilot to be overtaken is more difficult than it seems – you never seem to get there for he keeps moving out of the way! Being tall and thin helps but the solution fortunately is more basic than that. The solution is to walk towards the pilot-to-be-overtaken's left shoulder and you will find yourself naturally behind his right shoulder – the place you want to be.

If pilot 'A' is walking *small* circles, the procedure described in the sketch is quite practical without 'B' having to run or do any other abnormal/unsafe things. However if 'A' walks *large* circles, 'B' has to run and will find overtaking most difficult, if not impossible, to do within the rules. The same goes if 'A's lines are to the left of the tangent to his walking circle (flying 'Russian' we used to call it). By doing these things, 'A' becomes a 'blocker' and will be obstructing 'B' – a rule infringement that is more and more easily spotted by judges these days. However if 'A' keeps on obstructing despite your obvious distress or warnings received, what does 'B' do? Still, I am afraid, a question not decided by the rule-makers. In the UK judges allow the line-cross, i.e. 'B' may fly with his lines over 'A's so long as this does not result in 'B' whipping. The line cross does solve the problem if 'A' genuinely is obstructing but if he isn't, then 'B' of necessity will have to whip or pivot to complete his overtake and a warning will result; it really is obvious to any judge, so for me line-crossing is the means of last resort; once per contest is quite enough for I hate to expose myself to situations where a warning may well be inevitable.

Landing. Not very difficult to do, too easy some might say, but landing 'incidents' are depressingly frequent – good technique keeps you out of trouble here!

Shut-off after you have started to move out of the middle, not before. Your arm is free now so full control can be maintained and other pilots will not get in your way. Get right out of the way of the other pilots by quickly getting about half-way out. Stay half-way out and duck. Your head getting in someone else's lines is something no one should want to do. Keep just airborne until over all grounded models in front of your pitting segment. Also keep in a bit until you are over these models – you wouldn't want to hit a mechanic would you? It can happen. Only when you are past the last segment in front of yours, land and move out. Remember to stretch for the catch but not to step over the edge of the piloting circle until your mechanic has caught the model. The stretch will mean that you have to get pretty far down – do this because the rules require it, and keep on your way down so that your handle, as the rules require, is grounded immediately. One little trick I have



LANDING: 1, Shut off; 2, Quickly move out; 3, Duck down; 4, Stay airborne; 5, Stretch for the catch.

been taught on grounding the handle is to do it at the end of an anti-clockwise half-loop with your handle. This gets the lines in front of any grass, stones etc on the tarmac, not behind them as frequently can happen giving a nasty ground-loop on the launch of the model which invariably puts you out of the race.

Eyes, Ears and Mouth. Important parts of the pilot's equipment are these, so use them correctly. Use your eyes to see *everything* – not just your model. To continuously renew your knowledge of: where the other models are and what they are doing; where your mechanic is and the others too, and what they are doing; where the judge(s) is and what he is doing; if there is a height-marker, how does your flying height compare; if there is a warnings-board, how many warnings you have.

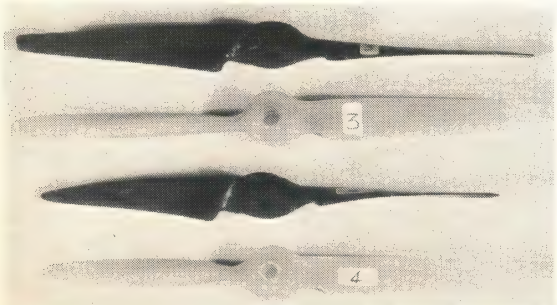
Essential knowledge and I recommend re-acquainting yourself with these using your eyes once per lap is a good habit to acquire. Your ears are just as important. Listen for: what other pilots are telling you; what your mechanic is trying to tell you; what the race marshal may be trying to tell you; what your motor sounds like.

The last point can be quite critical for, as Henry Nelson has written: "the pilot has his hand on the needle" – unloading the motor by flying low and fast you can cool the motor and thus counter an over-lean run, and by loading the motor, fly high and slow, you can warm up an over cool motor. Pilots hear the motor much better than mechanics can due to being a constant distance from the motor, so good information from the pilot to the mechanic can be most useful especially during practice; there may be too much going on in a race for the message to get across clearly. Being prepared to listen is vital to learning what you are doing wrong; judges, spectators, other competitors, all are quite prepared to tell you, all you have to do is listen.

Finally the mouth. Race marshals are unpaid voluntary persons doing a demanding and not very satisfactory job. It is all too easy for frustrated competitors to 'mouth-off' at the officials but this is almost always counter productive. Being polite and helpful just may result in 'kind' treatment. If there is any 'benefit of the doubt' going on, it should be you who gets the benefit. and you won't if your behaviour has marked you out as a 'nasty'. Do by all means ask what you are supposed to do and ask for explanations. Most of us are more than willing to provide such information if the query is made politely and at the right time.

Conclusion. There is a great deal to learn with respect to correct piloting techniques. I hope I have laid out the basics and, if you think it all sounds difficult, remember (as the actress said to the archbishop), if it wasn't difficult, it wouldn't be fun! Believe me being a successful Control-line Racing pilot is fun. (Although not nearly as much fun as being a Bishop.)

Glass and Carbon fibre props from Mario Rocca. Top: F2A 6 × 6⅜. Below: F2C 7 × 7½. See classifieds.



COMBAT

by Ian Hutchinson

MAINSTREAM TROPHY – *April 23rd*

Sunny clear skies and a low wind set the scene for the first major Combat competition of the 1978 season. On the agenda was the Mainstream Trophy for FAI and for the first time a ½A Combat event was also held.

The site itself was the playing fields adjacent to the noisy sports centre at Wigan, separated from housing by a trading estate. The grass, though slightly soft underfoot, was mown to a perfect length and area, and there was no shortage of space for practice. Competitors started arriving at 9.00a.m. – travelling from as far afield as Norwich, London, Windsor, Leicester and even Dorset.

The Mainstream Cup, first prize for FA Combat, was supplemented with six smaller cups donated by North West Model Supplies, three each for FAI and ½A. Trade prizes of gallons of fuel, lines, kits, engines, printed tee shirts, vouchers and a year's subscription to *AeroModeller* completed a very worthwhile prize list. Stockport Club wishes to thank the Manchester Model Shop, Michaels Models, Powermax and the *AeroModeller*.

This was the first event run to the new FAI Combat scoring system and the radical effect that the increased penalty of ground time had on the results of each bout soon became apparent. Very few bouts resulted in close scores with one third of the bouts having victories by a margin well in excess of 300 points. The importance of remaining airborne really was highlighted, and from the number of flyers returning hefty minus scores, this certainly is an area needing a lot of polishing up in the coming competitions. Highest winning margin of the day was Steve Malone's 1st round win of 510 points.

A line check was done for every competitor, a rule not always observed at competitions. Very worthwhile, however, as three bell-cranks pulled out and two sets of lines broke during the pull test. As a result of this precaution no model suffered a fly-away throughout the entire contest.

The event attracted thirty entries for FAI and a losers round was flown to bring the numbers up for the second round. Good news at least for Dave Wood, three times winner of the Mainstream, who got back into the contest after a 1st round defeat by Stewart Sparkes.

The expected unveiling of super combat models from those selected to fly at the team trials on 6th May failed to materialise. Although this was to be the only contest in 1978 prior to the Trials itself it appeared that most potential team members wanted to keep the secret wraps over their latest developments. Only novelty of the day was Mike Fitzgerald's entry with an Oliver Tiger nylon covered model; how times have changed.

The Semis produced a major win for Steve Malone with another massive 454 point victory over R. Stitson to meet Dave Wood in the final. Dave narrowly missed making it his fourth consecutive winning of the Mainstream Trophy when he lost by 46 points to Steve. Consolation prize however was a special cup presented for his previous three years wins.

Alan Tyson of Penrith Club who came third over Richard Stitson with his Super Star III powered by S.T G20/15. Right: Andrew Hellawell plus girl friend from the Halifax Club with his P.A.W. powered own designed ½A model.

Left: Winner of FAI Steve Malone with pitcrew (centre) Paul Landels and (right) Mick Tiernan. Middle left: Stewart Sparks of Bournemouth Club winning over Dave Wood of Stockport Club during 1st round. Middle right: Pete Tribe of Cosmos winning over Trevor Sayer. Right: ½A Finalist Dave Heaton who beat Michael Riley, Dave Heaton's model for the final was ½A Tamer designed by Dave Clarkson and powered by PAW 149.

Meanwhile the ½A combat event was by comparison run on a far more relaxed system than FAI in order that the newcomer could enjoy himself and the experts could unwind. Entries were lower than expected probably due to flyers being tied up with the FAI event. Eventual winner Dave Heaton who used a Keil Kraft Gazzelle for most of the event, changing to a Dave Clarkson designed Tamerlane for the Final, gaining 1st place over Michael Riley.

Final innovation came from the local Free Flight lads who took a day off from their chuck it and chase it flying to help run the event, and to whom the Stockport YoYo brigade extend a hearty thanks. Sounds like a good basis for mutual assistance in future events.

Northampton MAC ½A Combat Comp *16th April Brackmills*
Following increased interest in control line flying in the Northampton Model Aircraft Club during the past year, this contest was prompted by the rise in popularity of the ½A combat class. The support for the contest was very good, with twenty four senior and five junior fliers competing. Sunday remained dry, mild and very calm. It was decided to run a separate junior contest, to help encourage flyers so they wouldn't be outclassed.

The first senior round got under way at 11.00am, and right from the first bout the standard of combat was high Marc Harrison, intermediate winner at last years Nats, beat Jarret two-nil in this excellent opening bout.

The first round of the juniors then commenced. Jacobs beat Montgomery-Smith, while Simms beat Hudson. Collin got a bye, and to make the semi-finals up to four, Montgomery-Smith and Hudson reflew, with Hudson emerging the winner.

The junior semi-finals were run after the second round had been completed. In the first semi, another very good bout had Jacobs beating Simms three cuts to one. The second semi final saw a win for Hudson over Collin. After a short pause, the junior final was run, producing a win for Jacobs over Hudson by two cuts to nil.

The quarter finals was greeted by one of the best bouts of the contest. Stonelake and Rendell constantly harassed each other, and the bout ended with the cuts equal at three all. A check of the score cards showed that Stonelake had four seconds less ground time, thus narrowly winning. In future it may well be worth including a rule requiring a minimum difference of say 5 or 10 points for a victory, scores any closer than this requiring a refly.

In the first semi-final, Stonelake's fine run was halted by Benzing, who won by one cut to nil, thanks mainly due to some incredible pit work from Harrison and Rendell. At the end of that semi-final, Benzing's model was practically held together by masking tape. The second semi-final saw Brian Atkinson and Kim Bush fight a close battle, with Atkinson winning by two cuts to one. After the semi-finals, the fly-off for third and fourth place commenced. It proved to be one of the most exciting bouts of the afternoon. In the first thirty seconds, Bush removed all of Stonelake's streamer. It seemed that Stonelake could take the required two cuts at will, but Bush did what he had to do, by constantly keeping on Stonelake's tail to try and remove the knot and the small snippet of streamer. In the last few seconds Stonelake managed to equalise, but was down on ground time– thus Kim Bush took third place and Stonelake took fourth.

After such a good third place fly-off, there was the slight worry that the final might be an anti-climax. Such thoughts were instantly dismissed when Benzing and Atkinson got into the air. It was a fitting end to a contest where the standard of combat was consistently high. Benzing took half of Atkinson's streamer and then proceeded to get another cut. leaving about two foot of streamer. Atkinson managed to get one cut back. Then in the final minute and a half, Benzing got two more six inch cuts, which made the score four to one. Atkinson fought back to make it four cuts to two, but it was too late. Thus Benzing won, but it was no easy walkover.

A fantastic days flying and a certain endorsement that ½A combat is here to stay, of the models themselves about half the entry were polystyrene foam, the remainder being traditional balsa. Neither type seemed to have an edge over the other and both types stood up well to the rough and tumble of crashing and hitting the ground with little damage, unlike their larger FAI counterparts these days. As an experiment streamers 8 foot 6ins long (a standard crepe paper size) and ¾inch wide this worked well as it didn't slow the models down too much and prevented a jump in speed for the loser as he lost his streamer. As results showed this was still long enough to take 3 or 4 cuts, with the 35ft line length making it easier for pilots to judge distance leading to more accurate flying.

Seniors 1st J. Benzing, 2nd B. Atkinson, 3rd K. Bush and 4th M. Stonelake.

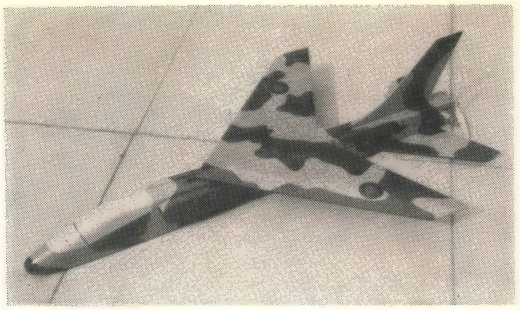
Juniors 1st I. Jacobs, 2nd D. Hudson and 3rd equal Simms and Collin.

INTERNATIONAL COMBAT EVENTS

3 – 4 June	6th Coupe D'Europe de Combat, Marville. Details from Jean Paul Perret, 101 rue de Lorraine, Cosnes et Romain, 54400 Longwy, France.
17 – 18 June	6th Suebia Cup, Bietigheim, Germany. Details from Peter Willmer, Marienstrasse 9, 7121 Löchgau, West Germany.
19 – 20 August	Dutch International, Amerongen, Holland. Details from V. d Weerd, Bethoven Laan, 95 Arnhem, Holland.

Northampton Finalists. Left: Juniors D. Hudson and I. Jacobs and Seniors J. Benzing and B. Atkinson after a super final.

READERS' LETTERS ...



Chris Pinn's APS Saracen finished in camouflage gives it a topical appearance. Plan PET 830X is still available price 80p incl. post.

Dear Sir,

How very refreshing to read Bob Wells' common-sense article in the April *Aero-Modeller*. At the time of the 1954 rule changes there was a good deal of misgiving about the radical new approach imposed externally on us by the FAI. Indeed many Wakefield experts in this country gave up in disgust.

It is of course right and proper to experiment with rules for new types of model contest, but these should succeed or fail on merit and not be improved without proper and adequate trial and debate. It is a sorry reflection that model rules (as opposed to contest rules) have remained fixed so long, because this has led to stagnation in A2 and Wakefield design. The development of power models has only proceeded due to the stimulation of increasing engine power.

As Bob made clear, the essential feature of the "old" rules was that they put the emphasis on the structural as well as aerodynamic development of the model. Performances became too high for convenience, but with the wisdom of hindsight it seems to me that the wrong method for its limitation was chosen. Any rule restricting the power performance of the rubber model must detract from the essential appeal of the type, and leads to the tedious tactical type of contest we witness today.

It seems to me that rules which restrict the glide performance are more acceptable, and plenty of possibilities are available: fuselage cross-section rule, free-wheeling propellers mandatory, limited span and/or fuselage length. Clearly rules which involve simple measurements of length, rather than weight or landing restrictions, are preferable because of their ease of checking.

I certainly support Bob's call for a Jubilee contest to the old Wakefield rules and if some of our rally organisers would include it in their programmes it would be seen again as the challenge and trial it surely was. In the longer term I do hope that the SMAE will look again at the objectives of free-flight competition. Perhaps a sub-committee should be raised to consider and report on this rather vexed question. With the right initiative Great Britain could again lead the world in free flight competition practice.

St Albans, Herts Martyn Pressnell

Dear Sir,

Ian Peacock, in his article "Let Us Spray" in the April issue of *AeroModeller*, states on page 205, regarding the Stanley Bridges compressor, that "there is no safety valve and the drill must be switched off to stop spraying". I feel that mention should be made of the fact that, used in conjunction with the Stanley Bridges spray gun, this is not necessary; the gun is triggered in the normal way.

Incidentally, I have used this equipment for many years, including respraying whole cars, and have found the finish compares favourably with that obtained with far more expensive equipment. I have no connection with Stanley Bridges.

Potters Bar, Herts K. E. Rickard

Dear Sir,

I am enclosing some shots of PET 830X 'Saracen' which, if of acceptable quality, could prove of interest – particularly to the younger reader.

It has taken some 16 years since seeing the original Saracen perform at the 'Northern Heights' to find a chink in the building programme to make one!

Some points which could be of value, I feel are:

1. The cockpit shape shown on the plan is a bit dated and I think the 'Hawk' outline more in keeping.
2. The up-to-date 'Jaguar' camouflage is dead easy as there is no demaracation line between top and bottom. I had to do the 'low visibility' roundels and fin flashes with a mapping pen, though.
3. I used a 'Merlin' for power radially mounted with longer bolts through the crankcase lugs – very quick and being a diesel eliminates fuel proofer.
4. Made the tank from the end of a Magic Marker felt pen crimped onto three brass tubes and araldited. Took all of ten minutes and *no* soldering!

I realise it is not possible to have photos of the X-list plans but I wonder how many youngsters realise that there is such a super up-to-date plan as 'Saracen' there.

If photos are not of interest please file in the 'round file'!

Chris Pinn

Cubbington, Warwicks.

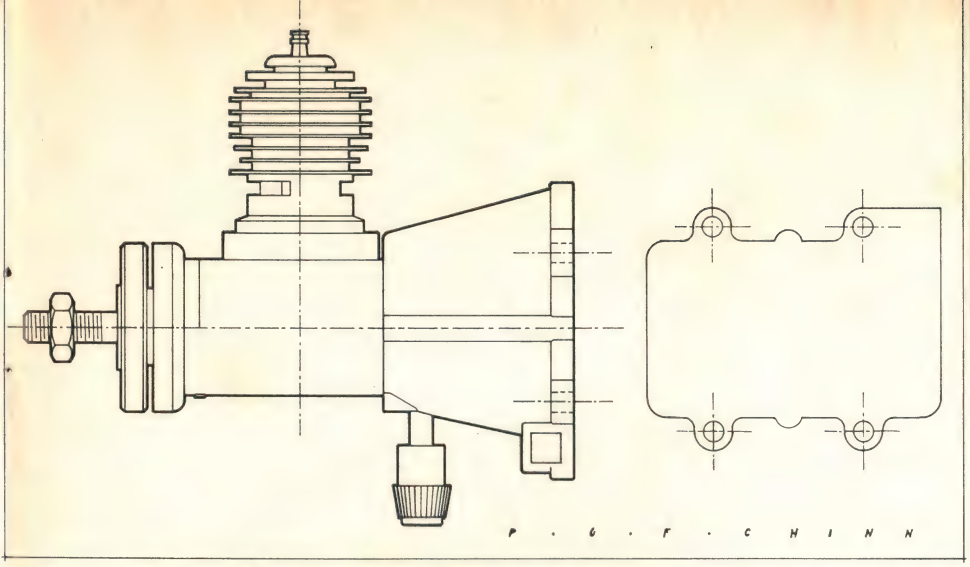
There's a Place for You on your Local Sports Council

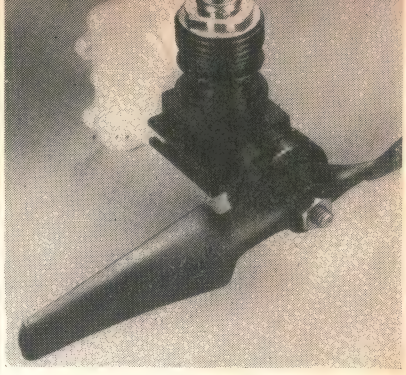
Model flyers in Hillingdon have a problem. At a recent meeting of their local Sports Council the Chairman said that if a model flying representative had taken part in their meetings, they would have been able to bring more pressure to bear during the drafting stages of a byelaw in which (wait for it) the Borough are trying to ban all power-driven model flying in their parks and open spaces. With the work the SMAE have done over the past four years for the Hillingdon flyers (most of whom are not even members of the Society) the resulting double approach could well have had a very different result.

Effective from January there now *is* a model flying representative on Hillingdon Sports Council, but the time to get involved with your own local one is now. Local borough Recreation Committees normally send a representative to meetings and participation is the best way to ensure that model flyers in your own part of the country get the best facilities. Through the SMAE's area system a local representative has access to the Society's national experience, which is vital, since it is rare today for a single person to have the wide background and knowledge of all branches of model flying necessary to ensure adequate representation on local Sports Councils.

These local Sports Councils can help sports in the normal course of events, not just when a problem arises; publicity, event planning, financial aid, dual use and site acquisition are all part of their work, so don't wait till you have a problem locally. Apart from the benefits to your clubmates, the experience you gain can help model flyers in other parts of the country through the SMAE (and after all, that is the only national organisation for model flying from which people can seek help).

In Hillingdon, like the rest of Britain, local model flyers have had a free ride, so to speak, on the shoulders of their colleagues in the SMAE, for a number of clubs and many flyers are still not affiliated to the Society, who thus have to work in the dark to some extent; it is to your own benefit to pool resources. Write to the SMAE's full-time General Secretary for details of where your own local Area Committee holds its monthly meetings – come along and join the flyers who do the work.





Above: Tester 8000 ·049 size glow motor normal running position is with cylinder head lying horizontal due to design of integral tank. Proved to be one of the more powerful ·049s yet tested.

Engine Test

TSETOR 8000

by Peter Chinn

THIS NEW engine, manufactured in the United States by the Testor Corporation at the former Wen-Mac plant in Los Angeles, will shortly be available in the UK. A replacement for Testor's McCoy 049 which, itself, was a development of the previous Wen-Mac 'Thunderbolt', it will be used in Keilkraft's familiar *Hawker Hurricane* ready-to-fly control-line model (as were the McCoy and Wen-Mac 049 engines before it) and will be available through both Keilkraft and Ripmax dealers.

In many respects, the Testor 8000 engine is very unusual. Its top end assembly, consisting of a hardened steel piston coupled to a hardened steel conrod by a ball-and-socket joint and running in a one-piece soft steel cylinder with screw-in glow head, is in accordance with conventional American 'Half-A' glow engine practice but the rest of the engine is mostly quite unorthodox.

For example, the crankcase, instead of being pressure die cast from aluminium (or, as in the case of the Cox engines, machined from extruded aluminium bar), is moulded from black glassfibre-reinforced nylon. This, of course, has required a moulded-in bush for the main bearing, which is of zinc alloy rather than bronze, cast-iron or aluminium alloy. Also moulded in place in the crankcase is a brass thread insert for the screw-in cylinder.

There are no mounting lugs on the crankcase. Instead, the 8000 is attached to a large white translucent tank-cum-induction unit, moulded from Celcon C90, which has a projecting boss that simply pushes into the back of the crankcase and snaps into position. This has four lugs at the rear for bulkhead mounting of the engine. As normally assembled, the Testor 8000 is set up as a 'sidewinder', i.e. with the cylinder horizontal and pointing to the outside of a normal anticlockwise control-line circle. The needle-valve is therefore on the left side and the air intake is immediately behind it. Fuel is picked up from a pressed-in spraybar and the mixture is then drawn forward to pass through a simple reed-valve in the boss that is inserted into the crankcase. The reed-valve itself is of plastic (5 thou Mylar), rather than the usual beryllium-copper or steel shim material, and is held in position by a Celcon ring.

Another exclusive feature is the 'Rotomatic' starter, the only integral self engaging starting device fitted to any model engine at present, but one that has stood the test of time on literally millions of Wen-Mac and McCoy ·049cu.in. engines over a period of nearly 20 years. It consists of eight parts. The starter spring is of the flat 'clock-spring' type and is coiled inside a pressed steel housing permanently fitted to the crankcase nose. The outer end of the spring is anchored to the housing, while the inner end is secured to a mild steel sleeve freely mounted on the projecting o.d. of the zinc alloy main bearing bush. This sleeve transmits the starting impulse to the crankshaft via the clutch assembly contained within the driving disc.

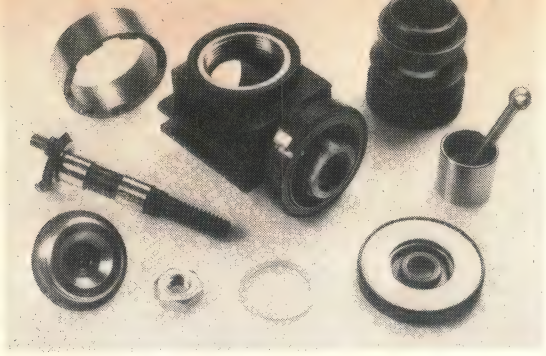
The driving disc is pressed on to a knurled portion of the crankshaft. Inside, it contains a hardened steel cam plate and two small flat hardened steel rollers. The cam plate is keyed to the starter spring sleeve and when the drive disc is rotated by revolving the prop backwards, the rollers move tangentially outwards to lock the cam plate to the drive disc and so engage the starter spring On releasing the prop, the motor is spun rapidly over several compressions, the clutch being automatically disengaged as the spring returns to its original position.

Packaged with each Testor 8000 is a 5½in ×3½in Testor polypropylene propeller, two plastic knobs for the needle-valve (one extra long with a plastic sleeve extension) and a simple ring type silencer. This latter is a sintered steel moulding with a fairly thick wall (·070in) to reduce noise emission and has eight small slots at the top, through which the exhaust gases escape. It is fitted by unscrewing the cylinder and inserting it between the bottom fin and the top of the crankcase.

Performance

Our two test samples came direct from the US and had been checked at the factory but not fully run in. As already noted, the 8000 is set up for mounting with the cylinder horizontal and this is how the engines were tested. It is not practical to mount the complete unit, as assembled, with the cylinder upright as this would bring the fuel filler to the bottom and the fuel pick-up to the top of the tank. If, however, the user prefers an upright cylinder, it is possible to reassemble the tank and engine so that the tank remains in the correct position. This will mean that the projecting peg at the bottom of the tank no longer locates in the channel on the crankcase, but we found that the fit of the tank boss in the crankcase was firm enough to resist any tendency for the engine to rotate on it. In any event, it would not be too difficult to fix some form of locating device on the model to take the place of the peg.

Like most 'Half-A' class motors, the Testor 8000 runs best on a fuel containing a reasonable amount of nitro-paraffin. The manufacturer's recommendation is a 15% nitromethane blend. In the US, Testor's own fuel contains



Above: Layout of component parts with muffler ring top left, unusual glass fibre filled nylon crank case including spring starter in front housing.

this amount of nitromethane plus a Ucon synthetic lubricant. The reason for using a synthetic oil, rather than castor oil, is because of the latter's tendency to coagulate in the working parts if the engine is left unused for several months. The Rotomatic starter unit and reed valve in particular, may become inoperable if residual castor oil is allowed to thicken in the engine We emphasise that this is only likely to happen if the engine is unused for a very long time and it can, in any case, be prevented if the engine and tank are thoroughly rinsed out with straight methanol immediately after use and then lubricated with machine oil (as described in the instruction leaflet) before being stored away.

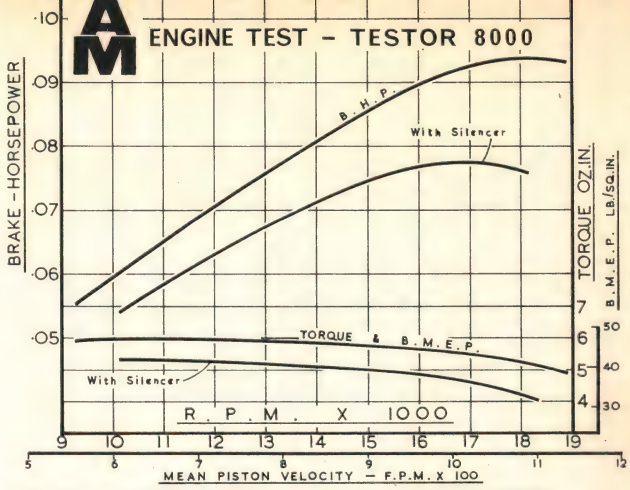
Compared with the engine that it has replaced (the Testor McCoy 049), the 8000 was found to be considerably more powerful, with a maximum torque of 6·0oz in. at 11,000 rpm and a gross bhp (less silencer) of ·094 at 18,000. This is very good indeed for what is basically a a sport type reed-valve 049. In terms of prop speeds, the engine turned its own $5\frac{1}{2}\times3\frac{1}{2}$ Testor polypropylene propeller at 14,600 rpm and a 5×4 Testor at 14,200 rpm. Other figures included 13,400 on a 6×4 Top Flite nylon, 13,900 on a $5\frac{1}{2}\times4$ Cox grey nylon, 14,800 on a 6×3 Tornado nylon, 15,200 on a 6×3 Cox grey nylon, 15,700 on a 6×3 Top Flite nylon and 16,300 on a $5\frac{1}{4}\times4$ Top Flite nylon.

The 8000 was also checked with the muffler ring installed. This reduced maximum torque to 5·3oz in. and peak output to approximately ·077 bhp at 17,000 rpm. Prop revs were reduced by between 800 and 1,100 rpm on the most useful sizes. Incidentally, although the above performance figures relate to the best of the two examples tested, random checks indicated that the second engine was always within 100-200 rpm of the first one.

General handling qualities were good. The 8000 can, of course, be started in the normal way by simply flicking the prop but the Rotomatic starter is undoubtedly a considerable help to any beginner who has had no previous experience of model engines, since it will deal more effectively with, for example, a flooded engine, than will normal hand starting techniques. Even experienced modellers are soon converted to the Rotomatic starter. It is, after all, very easy to operate: there are no pawls or springs to engage; one simply winds the prop backwards $1\frac{1}{2}$ turns and releases it. Incidentally, it is advisable to firmly grip the prop blade between the thumb and forefinger when winding it back, so as to avoid a painful whack from the starter if one's finger should slip.

In all other respects, the engine is very docile and the rearward position of the needle-valve means that adjustment can be carried out safely well back from the prop while the engine is running.

Power/Weight Ratio (as tested):
0·687 bhp/lb (less silencer ring)
0·520 bhp/lb (with silencer ring)
Specific Output (as tested):
115 bhp/litre (less silencer ring)
94 bhp/litre (with silencer ring)



SPECIFICATION

Type: Single cylinder, air-cooled glowplug ignition two-stroke with reed-valve induction and integral spring starting device. Integral fuel tank. Optional ring type silencer.
Bore: 0·4202in. (10·67mm)
Stroke: 0·3600in. (9·14mm)
Swept Volume: 0·04992cu.in.–0·8181cc
Stroke/Bore Ratio: 0·857:1
Checked Weights: 62·2 grammes – 2·19oz
67·3 grammes – 2·37oz (with silencer ring)

GENERAL STRUCTURAL DATA

Crankcase moulded from 40% glassfibre-filled Nylon 66 with moulded-in zinc alloy main bearing bush and moulded-in brass thread insert for cylinder. Hardened and ground Ledloy steel *crankshaft* with two $\frac{7}{32}$in. dia journals and $\frac{3}{32}$in. dia crankpin on circular crank web with crescent counterweight. Ledloy steel *cylinder* with integral cooling fins, externally threaded below base flange for attachment to crankcase and internally threaded above bore for glow-head. Hardened steel *connecting-rod* with ball joint small end retained in hardened steel flat-crowned *piston* by internal circlip. Screw-in aluminium alloy *glow-head* with platinum-iridium element and seating on ·025in. soft aluminium gasket. *Crankcase backplate, reed-valve housing, air-intake, fuel tank and radial mount* moulded from Celcon C90 plastic, ultrasonically welded into single unit. *Reed valve* of ·005in. Mylar film, held in position by Celcon ring. Pressed steel *starter spring housing* fixed to crankcase nose with two drive screws. Machined Ledloy steel *clutch-housing/prop-driver*, sealed in unit with hardened steel drive cam and rollers and pressed onto knurled length on crankshaft. Silencer ring of sintered steel.

TEST CONDITIONS

Running time prior to test: 1 hour approx.
Fuel used: 15% pure nitromethane, 20% castor-oil, 65% methanol
Air temperature: 12°C
Barometer: 1030 mb (30·42 in.Hg)
Silencer: Manufacturer's ring type as supplied.

Close up of fuel tank and motor mount with filler back right corner. Tank just snaps into place in rear of crankcase extensions for needle valve allow adjustment if fitted inside cowling.

Bill Dennis' Armstrong Whitworth FK8, placed 2nd at Class 2 Scale event at Odiham, 9th April. Note tension spring on tailskid has snapped on this second flight

Scale Matters

Alan Callaghan relates all the latest news and views on scale modelling topics

THE FIRST EVENT to be run to the newly formulated Class 2 rules for FF Scale was held at RAF Odiham on 9th April. The SMAE Scale Committee devised these new rules as an attempt to attract more people to enter contests having a much more low-key atmosphere than the usual SMAE event, and where the emphasis, for once, is not on the super-detailed bomb-dropping wonders.

Despite the event receiving no prior publicity to my knowledge (hardly the best way to attract more entries!), a total of eight models took to the air including a double entry by David Kew. Apart from being fairly chilly, the conditions were ideal with very little wind or drift, and an excellent stretch of smooth clean runway for ROG attempts. All but one of the entrants were members of the '2FSA' Association which in terms of keeping up with all the latest news in any specialised class says a lot for having a useful grapevine, but at the same time may give the impression that FF scale is an exclusive clique. It isn't! I hope the regulars won't take offence but there is plenty of room for a few new faces in this class, and the only way they will come forward and join in the fun is if meetings are widely publicised and give people plenty of notice.

Most of the models entered had been seen before on other occasions, but the biggest contrast to my mind came with David Kew's rubber-powered Focke-Wulf Ta 152 built from Hal Cover's plan in that excellent book *Flying Scale Models of WWII* published by *Model Builder* in GB from Argus Books. To anyone looking for something relatively easy to build either for outdoor rubber or CO_2 conversion this book contains a dozen designs by many builders which have all been properly worked out and tested.

Under the prevailing conditions at Odiham David's model was at no disadvantage and his best flight, including ROG, gave a score higher than that of his second entry, an APS Vultee Vigilante – an archetypal high wing cabin monoplane! The 152 flew at something much closer to scale flying speed than many of the other entries and its excellent stability was most impressive. Flight times were not great since the cold damp conditions took the edge off the performance of the elderly piece of good Pirelli being used, but there was no difficulty in putting in a qualifying time.

Eric Coates' DH9a flights were both notable for their very long take-offs and dramatic landings. The first came to a skidding halt very near to the open RC control tent, and the second resulted in a nasty thump on a hangar roof with the model bouncing off and landing in a nearby tree at 6 feet altitude! The wounds from such a charmed life were only a broken leading edge, a cracked wing

John Blagg launches 21″ span rubber powered Isaacs Fury. Eric Coates looks on holding CO_2 Porterfield Collegiate model. David Kew launching rubber powered Focke-Wulf TA 152 in 1:24 scale. Model flew extremely well in calm conditions and is very stable.

spar, and a few small tears and dents. More drama came from John Coker's Arrow Active when the cowling came loose on the first flight, and the second one developed into an excellent aerobatic display finishing with a relatively (and perhaps unexpected) gentle landing.

The absence of wind can be a handicap when trying to persuade a largish scale biplane to take off and Rex Oldridge's first attempt resulted in a wingtip touching causing the strut and bracing cell to collapse as the Albatros left the ground. This stable model then went on to simply tighten its turning radius and eventually landed virtually unscathed on the grass nearby. Rex's third flight was the second highest scoring of the meeting with a run that skirted the edge of the runway and the model lifting off smoothly within inches of the grass verge. I personally felt it deserved a much higher score with its self-correcting take-off and realistic banked circuits being tighter than usual. It is sometimes easy to forget how much fullsize aircraft need to bank when turning in relatively small spaces. Watch for it the next fullsize display you attend, and remember that the FF scale model is supposed to be displaying itself too. Bill Dennis's second flight with his Armstrong Whitworth FK-8 developed a worsening stall soon after a nice short take-off, resulting in a heavy landing with the model going downwind over the tarmac. Bill's top static score and very good first flight were, however, enough to keep him in a safe second place. Despite the cold, the meeting went off in an enjoyable atmosphere due much to the absence of arch enemy No. 1 – the wind – and fresh enthusiasm for a new season's flying. Other models flown but not in the contest included Rex Oldridge's CO_2 powered Corsair (also from *Flying Scale Models of WWII*), and John Blagg's rubber powered 21in. span Isaacs Fury I.

The results of this new system are worth recording in full for general reference:

RESULTS	*Static*	*Flying*	*Total*
1 Eric Coates DH9a	575	537	1112
2 Bill Dennis A-W FK8	605	450	1055
3 Rex Oldridge Albatros	460	455	915
4 Tony Creedy SE5A	415	361	776
5 John Coker Arrow Active	465	186	651
6 David Kew Focke-Wulf 152	340	304	644
7 David Kew Vultee Vigilant	195	228	423
8 Cedric dela Nougerede F-W Stosser	160	—	160

It is tempting to ask whether they would have been any different using the normal Class 1 system, and I suspect that there would be no dramatically different change. The need for the Class 2 system then very much becomes a debatable point, *unless* in the interests of encouraging more

Entries waiting to be judged at Odiham. In front is FW Stosser by Cedric Dela Nougerede and APS SE5a by Tony Creedy

people to take part in the event, those entrants with models that they would normally enter in a Class 1 event decline to enter them in this supposedly less critical alternative. The two first placings were taken by models both of which have won the Superscale trophy, and although these models' very high standards are admirable, there are not a great number of builders trying to emulate them. It seems unlikely that any new contest class will grow and flourish if the same models tend to win so frequently.

There are literally dozens of suitable prototypes in the APS range which, if neatly built and well trimmed for flight, ought to stand a very good chance of doing well in this type of contest, and there is still time to build something to fly later in the year at another meeting. Whatever else may be said about them, scale contests do sharpen up your techniques both in building and flying, and some new subjects *not* in Olive Drab would be a welcome change!

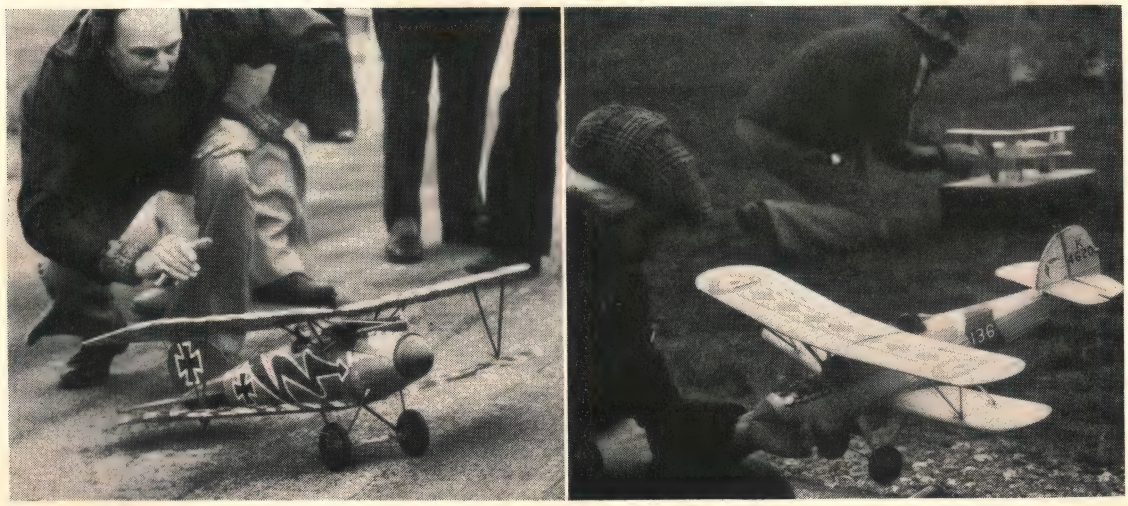
Since attending this meeting and having had time to mull over the results and the rules, I think a few points are worth a bit of an airing. The rules are published in SMAE News No. 102. If you wish to examine them in detail, join up!

New aspects are as follows: Static judging is carried out at a distance of two metres from the model so that small detail should not count for very much. Flight scoring has been changed so that options that have carried a heavily over-marked bonus in the past, such as the relatively simple bomb-dropping feature that has helped several winners of the Superscale event, are no longer valid. This seems to be going from one extreme to the other, since this kind of working detail is surely worth some kind of small bonus. A straightforward smooth and stable flight is the main requirement now, but there could have been included some marking provision for a landing under power. Most CO_2 and rubber models can do this easily and this is the type of event to which they could be quite suited. It is certainly not beyond the realms of possibility to make a powered model do this by using a small RC motor like the OS Max 10 with the throttle connected to a cutoff timer. This has been done in the past but seems to be overlooked these days as a possible option.

A complexity bonus schedule has been introduced that allows a good deal for a retractable undercarriage and multi-engines, but confusingly gives a low-wing monoplane double the bonus percentage of triplane. On checking this out I discovered that it was meant to refer to 'stability and difficulty of operation of the prototype'. Since there is a separate section dealing with a 'Stability Factor', it seems that the same aspect is being marked twice. Conventions in deciding whether an aircraft is a stable FF subject or not are not nearly as clear cut or as sensible as they seem, and practical experience proves this. There are many parasol/high wing monoplanes, eg Lacey, Luton Minor, Monocoupe, Bellanca Citabria, Fokker D VIII, etc, etc, that because of lack of dihedral would be very tricky to fly outdoors on a normal day due to having little inherent stability, and these will get no automatic bonus. Yet these models would be further penalised if the dihedral were altered. On the other hand some low-wing subjects like the Fw 152 and Corsair mentioned earlier, which from their flying performances appear to be naturally very stable, gain an automatic 10 per cent plus another possible bonus through not requiring increased dihedral. This section relating wing position to stability seems quite wrong when the only people who are in any position to judge it are the manufacturers of the full-size aircraft, or the fellow who's built a model and tried it. On page 154 of Vol 2 of *British Civil Aircraft Since* 1919 by A. J. Jackson (Putnams), there is a photo of a DH Moth Minor (would score a minimum bonus of 10 per cent) being flown 'hands-off' by the two occupants. Now *they* could tell us something about stability!

Formulating sets of rules for any kind of scale contest certainly is not an easy task, but any rule that radically affects your choice of scale subject is, to my mind, a bad one, and the checklist type of 'how many wings has it got and where are they' seems to fall into this category. This is the worst aspect of the Peanut scale rules where one can predict one's static score fairly accurately even before drawing the model up to scale! Scale flying is unlike any other aspect of contest flying since the rules ought to be able to fairly accommodate a diverse variety of subjects without prompting one to choose any particular type. In other kinds of contest flying the exact opposite occurs where the model simply must be built to the rules or it cannot be entered.

Rex Oldridge releases his APS Albatros designed by Doug McHard. PAW 2.49 power. Very colourful subject seen on its second flight. Eric Coates testing ED Super Fury in Hawker Nimrod. John Blagg prepares Isaacs Fury for rubber power in the background



If we are looking for a secondary scale class formulated along slightly different lines to the Class 1 event, more emphasis could be placed on the quality of construction and neatness of finish rather than trying to evaluate stability, since these factors are totally independent of the type of model; and the hope that the next model will be a better piece of workmanship than the last must be a part of most modellers' attitude to building. I would welcome any correspondence on the subject of the Class 2 event.

More and more it seems that CL Scale is a dwindling interest in this country with only a very few devotees carrying on the good work. Whether this is due to lack of suitable sites or the automatic 'graduation' to RC flying by potential practitioners is difficult to say. Just before completing this column I was able to visit the excellent new CL site organised by the Elmbridge Model Club at Fairmile Common near Esher in Surrey. This purpose-built site has room for two fullsize circles on a very smooth piece of asphalt, and it seems a great pity that more scale models are not around to make use of such a facility. A scale event held on the day attracted only three entrants, so at least no one had the terrible stigma of placing 4th! First was Wal Cordwell flying his familiar Waco biplane converted from an APS FF Scale plan; second was Ken Gardner with a conversion of the Veron Hawker Tomtit kit; and third was Dave Kenny flying an APS DH Mosquito with two tuned PAW 2·49 diesels. In absolutely perfect conditions they all had a very enjoyable time. For the second time in this column I hope I won't offend the regulars but CL Scale could also do with a few more 'names'. Where are you?

Visitors to last year's Nationals were not given any information in the programme on the weekend as to where and when CL and FF Scale events were being held. For those of you wishing to do some forward planning this year either as entrants or spectators the following information will be useful.

Both events will be at Barkston Heath and flown at traditional times. The FF Scale briefing will be at 5.00 pm Saturday evening near the main scale control centre or display tent. This is a good time for spectators also to be there to find out what is happening. If the weather is good, the first round of flying will take place once everyone has repaired to a suitable *up-wind* corner of the airfield almost straight away. If conditions are not suitable another attempt will be made usually around 7.00 am the following day again upwind on the field. If conditions are still 'no-go', the exercise is repeated at similar times. Control line flying will begin at 10.00 am on the Sunday, and is usually located somewhere central on the field since the wind is less of a governing factor. All the rounds of CL flying are held in one session so try to be there at this time if this is your interest.

Dennis Norman plus 1:72 B-52 catapult glider built up from sheet balsa Photo courtesy 'Model Builder'

An unofficial event for CO_2 and electric powered models will be held probably on the Sunday afternoon, and entries will be taken on the field. A similar event held last year drew a very poor response, again due mainly to a lack of wide publicity. It will be interesting to see what happens this year. Still nothing to encourage outdoor rubber scale! – a type of model possibly well-suited to the Class 2 ideal. It would be good to see this underrated class of model taken as seriously as by the 'Jumbo' rubber scale enthusiasts in the USA, since these lightly loaded models can be made to fly more slowly (and therefore more realistically) than many a powered model. Perhaps 1978 will see a few developments take place.

An interesting set of newsletters from Dennis Norman, editor of *Crosswinds*, the newsletter of the Cleveland (USA) Free Flight Society, shows an emerging interest in flying jet models another way other than by ducted fan or Jetex, namely the trusty catapult launch. Dennis's latest subject is a 1:72 scale Boeing B-52 which is not as first imagined a simple profile model, but a properly scaled and detailed piece of work built from sheet balsa. A number of 'Jet Category' scale contests have been held and the models are marked as usual for scale accuracy and then for flight duration. Of the six entrants in a 1977 event the winner was a Saab Lansen which put in a flight time of 37 seconds. Watch out Peanut flyers.

Catapult models have always carried an awkward aura of danger since at point of release they can be doing anything up to 70 miles per hour. The Cleveland modellers allay such fears by using an 8ft high pole to which they attach the 20 feet or so of ¼in. flat rubber, and this keeps the model high in the air at point of release. As Dennis suggests in his letter, jets other than airliners are rarely seen close to by most of the public. There are, however, many attractive subjects around and this simple method of flying is a good and cheap way of getting them airborne. A few years ago at the time when I built my own B-52 for Jetex power I also tried a KK Avro 707 delta, unsuccessfully, on Jetex. I then tried the model from a catapult launch but being a relative lightweight it lost momentum very quickly, the best it could do being a half-loop that occasionally turned into a very accurately performed flat spin. The catapult model needs to be fairly heavy to fly well, and a well-detailed accurate model is an interesting proposition. Anyone for a 1:72 Avro Vulcan with a sheet-covered foam wing, plus enough ballast near the CG?

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CLUB NEWS

ONE TOPIC close to the heart of the aeromodeller, sometimes too close, is the weather. It is often said that whereas other countries have climates we just have weather – and lately we have had too much of our weathery type of weather, with rain and wind in constant attendance on our flying fields. I was at the point of getting really fed up with it all when lo and behold the skies cleared and the wind dropped to give a welcome touch of Spring to the Sunday morning flying field. For the time being all was forgiven, I got my models tested out and went home feeling quite happy with myself. Why cannot it be like that every Sunday?

Notwithstanding the weather, the **Bristol & West MAC** had a super free flight start to the contest season, according to John Bailey, the club PRO. Following Tony Comfort's third place in A1 Glider at the Mini event Chris Batty showed he is back to top form, after a lean season last year, by winning the first SMAE, Open Rubber, event. In the *KMAA*, glider event, new members Ray Audley and Ray Inker did exceptionally well to take 2nd and 6th places. And, with Derek Wain backing them up, they took the club into a healthy lead in the *Plugge Cup*. Maintaining that ascendancy in the *Halifax* Power event is not going to be easy, but with three members flying in this event, anything can happen. A club with much to offer, on and off the contest field, Bristol and West is happy to report a steady increase in membership, but still would welcome any unattached free flighters in the West of England and South Wales, too, into the fold. Contact Dick Cummins, 14 Beech Leaze, Alveston, Bristol BS12 2NE for full details.

Next comes an appeal from the Publications Secretary of the **Leicester MAC,** Peter Catlow. He would like to contact other clubs for the purpose of starting up a regular exchange of newsletters. The Bulletin Editor is John Birch of 3 Fletchers Way, East Goscote, Leicester, who will be pleased to hear from other editors. Meanwhile we have to hand the latest Leicester newsletter.

A varied range of models lined up for the first (uncovered) stage of the Winter Building competition must have provided quite a skeletal sight, particularly with that old warrior, the Keil Kraft 'Ajax' rubbing shoulders with a YAK 18 PM. Dave Face, who entered both models, wishes to deny rumours that the Ajax is to be fitted with full house radio. I do not know offhand what a Reiher is, but D. F. Pullen who, if I remember correctly, won last year's competition, leads once more in this first round. His entry is followed by a Coupe d'Hiver which, entered by top free flight contest man, Gerry Ferer, will, no doubt, ultimately be seen on the contest field. The stages of the Winter Building event, uncovered, covered and flying, are but three items in a well stocked club contest calendar, in which R/C Thermal Soaring features most prominently, although F/F and C/L are not overlooked Very ambitious for a club event is the F/F Scale scheduled for 29th October at Wymeswold. Could this not be made an Open event?

Typical of the weather experienced throughout the latter part of 1977 and well into 1978, was that which wetly and windily depressed the Northern Area Winter Rally, held at Elvington in late January, and reported in the March issue of *Northern Area News* By their very nature Winter Meetings are chancy affairs, short in daylight and long in threatening forecasts. On this occasion the cold wind and the heavy falls of rain made for good midday business in the local pub if not on the airfield. Maxes did not come in abundance, and those that did put the model well outside the airfield. Even so, Russell Peers, that most energetic and determined flyer, put in a full house in Open Rubber to thoroughly deserve his win. On the R/C side of things they were making us oldies count our grey hairs by running a Vintage R/C event,

single control surface only. All five entries flew two flights with no crashes. Winner was R. Greenwood of Wharfedale, flying a K.K. Scorpion powered by an AM15.

A rather thin content this month in the *Scimitar*, the newsletter of the **Buckaneers Model Club,** but one item caught my eye, relevant to club life of today and yesterday. A skittish definition of the 'Average Club Flyer' is one who talks aeromodelling and attends club meetings quite regularly, but is seldom seen on the flying field. Such people, I might say, abounded in my younger club days. Following a lively, and often heated, club meeting, you would go over the flying field on Sunday to find it just as empty as all the verbiage uttered. I would have thought, though, that in these days of instant modelling the sheer physical effort of building a model plane would not be so offputting. Perhaps the sensible attitude to adopt towards these 'paper tigers' is to collect their subs and expect nothing – that is if you can collect their subs. Good value, though, in the Buccaneers for the active flyer: an annual subscription of £7.15 gives access to four flying sites, provides insurance cover and keeps the grass cut.

From *The New Message*, newsletter of the **North West Area** of the SMAE, comes more news of free flight contesting. The newsletter carries, as an addendum, the requirements of the A & B Achievement Certificates to be issued by the SMAE. The idea behind the awards is to raise the general standards of powered radio flying and to set particular levels of competence which could be used in general and display flying.

The **Five Wells Model Club** is situated at Wellingborough in the Midlands. From the club newsletter I learn that the club has the use of a farm site and also a twice monthly meeting room. A boost to club morale comes in the promise of transfers of the newly designed insignia, the work of Mr Wayne Hardy. Another useful amenity is a flight of three Combat models, available on request for any member, young or old, to have a go. A worthwhile service, this, as one of the main stumbling blocks to successful C/L flying is that first, whirlwind, uncontrollable lap, often with a most unsuitable model. In a way, the Combat model exemplifies the kind of model the beginner requires, being simple, light and semi-expendable, but with, perhaps, a little less power. RTP models need to be semi-expendable, too, it would seem, if they are to get the buzzy little models to loop on the line, as is discussed in the newsletter.

The **Maidstone Free Flight Group** has issued its first newsletter. It is clearly printed and nicely set out. A newsletter is always worth the trouble as it keeps members in touch and adds a sense of unity. Success or otherwise, though, depends on members, other than the poor old editor, making the occasional, or better still, regular contribution. However, the immediate concern of the group is to obtain permission to fly ½A Power in Mote Park, a large public open space in the centre of Maidstone. Must be quite extensive in area as it is already used by free flight models other than power. Permission may not be too easy to acquire as the introduction of power flying would mean a change in the bye law. The main difficulty, as it appears to me, is of the authorities identifying a model as ½A or lesser powered as opposed to any other models that the sanction of even limited power may attract. The situation should be helped by the advice to be given by the SMAE in the matter. Discussed in the newsletter are the various systems of circular tow for gliders. The art of using them to full thermal detecting effect is to maintain the right sort of line tension, but as this means sudden darting dashes over a fairly wide area, circular tow has its limitations over Ashdown, where bush, bog and bracken abound. The great advantage of circular towing, from the tactical point of view, is that you use the model as its own thermal detector. Anathema to those

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who look upon tactical flying as unsporting and opportunist, but welcomed by others who think that tactical flying adds an exciting dimension to contest flying. Certainly the ingenuity and artifice of the many fascinating circling tow gadgets cannot be readily dismissed.

More about Ashdown Forest in *SEADOG*, the newsletter of the **South Eastern Area,** of which the aforementioned club is a member. Ashdown is not exactly a model flyer's paradise, but it is somewhere to fly. However, like most open spaces these days, it is under pressure from users other than model flyers. In the case of Ashdown the invaders are the weekend cavalry, and since, in this country, anyone stuck up on 14 hands of horseflesh is looked up to in veneration they are given full rein whilst the poor old model flyers are kept on a short, area restricting, lead. Odd this, since it is the dirty big hooves that do most of the ecological damage. The Forest conditions are such that the Thermal Soaring events held there are more fly-for-fun than serious contesting. It is to Tangmere and other untrammelled pastures that the committed comp flyer looks for the glory and the laurels. Tough going there, too, for the Area free flighters, with the contest programme going on apace.

The ideal object to fly at Ashdown is a winged horse, one of which graces the cover of the **Sittingbourne & BMAC's** *Bourne Flyer*. For some esoteric heraldic reason poor old 'Peggy' is being attacked by four angry looking, swallow tailed jets – probably mistaken it for an angel one five. Since the Spot Landing event was held in gale force winds the venue of Straymarsh appears quite apposite. Wittily reported in the newsletter, the event was not without its humour, plus a few dramatic touches. Winner was Dave Monk.

Throughout that most uninviting Winter from which we have now, thankfully, emerged, the **Nottingham MAC** have had things really swinging, according to a report sent in by Jim Dobson, the PRO. In the great indoors, away from the squalls and snowstorms, the club has held a series of monthly Open meetings at 'Chilwell Olympia'. These have been most successful, with good support from other clubs. The indoor enthusiasm has borne fruit in an SMAE contest win for Barry Hotham, flying a 'Bucker Jungmeister'. Venturing bravely outdoors in February for Free Flight Glider, but the wind and the rain were lying in wait, and only Ken Oliver and Mike Chapman got models airborne before conditions became impossible. On the C/L side of things, Stunt contests are to be increased to three this year, and there is to be a 'Mini Slow' Stunt event, based on an article in our special C/L *AeroModeller*. The idea behind this type of competition is to open participation to the average sport flyer. And still on Stunt, the club is proud of the fact that both Bill Draper and Mike Chapman have been asked to compete for places in the national team.

From that newly American named Cleveland County we have news of the newly formed **Egglescliffe Model Club.** Membership after three meetings in a large arts room at Egglescliffe Comprehensive School is 18, but more can be accommodated. With a growing membership and good clubroom facilities the club is now on the lookout for a sizeable flying field. Meantime use is being made of the school playing fields. The club meets every Wednesday at 7.15 in the Arts block of the school, if you care to look in. Report from Mr W. Snowdon.

The **East Grinstead MFC** is one of the liveliest clubs in the South Eastern Area, featuring prominently in the Ashdown F/F events. So prominently, in fact, that they are the present holders of the *RAFA Shield*, and hope to retain it for 1978. On the home front the Chairman, John Jones, has kindly donated three excellent trophies for Precision, Spot Landing and Chuck Glider events. Much to his embarrassment, Tony Grantham, the noted free

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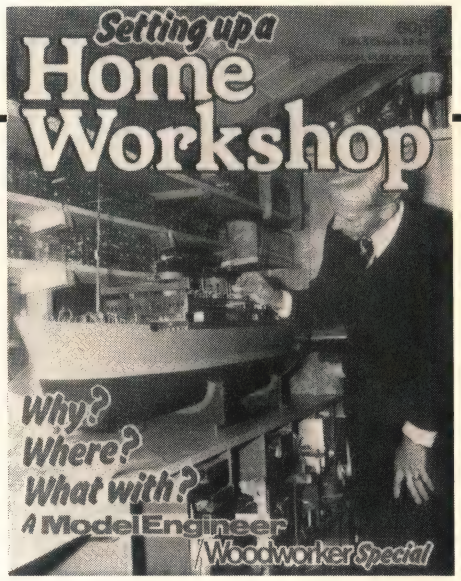

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CONTENTS SUMMARY

Light, heat and power; Benches, cupboards and shelves; Vices and work holding equipment; Bench and hand tools, safety and storage; Simple tool sharpening and upkeep; Power tools; installing electric motors; Do I need a lathe? Workshop electrical installation; Other machine tools to consider for the future; A garden workshop; Legal aspects.

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flighter, won all three contests, but refused the Spot Landing Plaque on the grounds that there were only two competing. A re-run has been arranged. Membership is steady at 19 with two juniors. Main interest is free flight, with some R/C. Report from Mr E. W. Young.

From David Verlander, Hon Sec of the **Southend Radio Flying Club,** we have news of the latest state of their very uncertain flying field situation. The super duper flying field, upon which hopes were pinned, is, alas, a rapidly fading dream and, for the present at least, the club must make do with a temporary field with the promise of Utopia some way in the future. Even so, the committee is still determined to restore the club to its former greatness, and in pursuit of this ideal are putting on a public film show on an aircraft theme at the Cliffs Pavilion, Station Road, Westcliff on Sea, on Tuesday, 13th June 1978. Tickets are modestly priced at 85p and the booking office number is Southend (0702) 351135. Block bookings of 20 or more get a 10p per seat rebate.

Mr L. A. Rogers, the **Western Area** Secretary, has sent us along the latest newsletter. This reports a part good, part wet day for the first Area Centralised event at Wroughton on 12th March. The large entry made for an encouraging start to the season, with a field of 19 in the All-in FAI event. Encouraging also, to see so many clubs represented. For the Area the first success of the season came with the splendid win of Rex Woodruffe of Swindon at the Centralised Mini Rally. In the A/1 Glider event he put up a full house of five maxes with his old faithful 'Asteroid'. Tony Comfort of Bristol and West was third. Giving support to the Area comps by doing all those very necessary flight card chores, Jeanette Silcocks, the sister of the Area Comp Secretary, has kept things going smoothly on the admin side.

Sorry for any necessary condensing of material. Your reports and newsletters welcome.

Clubman

Contest Calendar

May 27/29th	**BRITISH NATIONALS.** *C/L and R/C.* Venue: Barkston Heath. *F/F (European Trials) and R/C Soaring.* Venue: Cranwell.
June 4th	**INDOOR EVENT.** *F1D and 35cm Film.* Venue: Cardington. Contact: Laurie Barr, 0628-25595.
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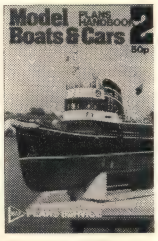

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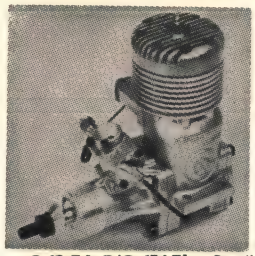

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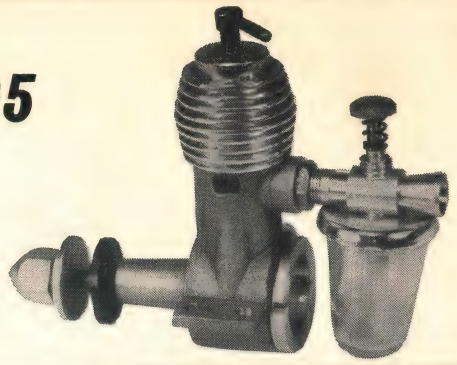

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